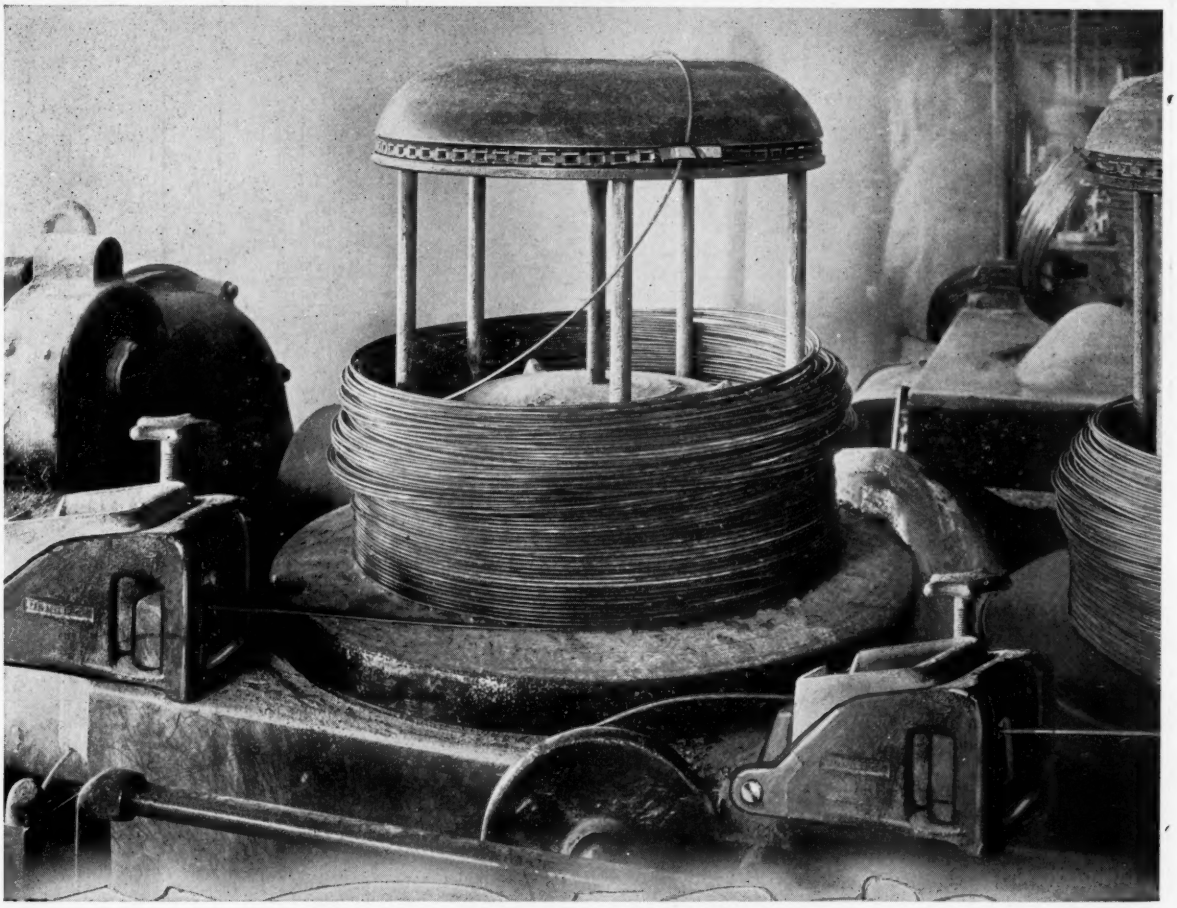
WIRE & WIRE PRODUCTS

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION



Morgan-Connor Wire Machines
Blocks in service, 1497—of which 972 are repeat orders.

MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS

MALMEDIE & COMPANY
Sole Licensee for Morgan-Connor Wire Machines in Europe
Maschinenfabrik Aktiengesellschaft Dusseldorf, Germany

July 1931

CARBOLOY DIES

Are finished by modern machinery especially designed for manufacturing CARBOLOY dies, thus insuring duplicate shapes—today or a year from today.

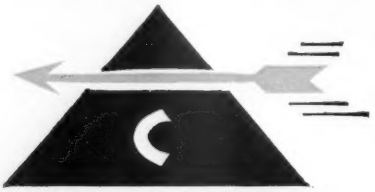
CARBOLOY dies, one-quarter inch and smaller, are checked for actual draw pull in pounds, thereby giving you uniform reduction.

The use of CARBOLOY dies will result in fewer breaks and will give you greater lengths.

CARBOLOY COMPANY, INC.

Die Sales Division
144 Orange Street, Newark, N. J.
704-2nd Ave., Pittsburgh, Pa.

Canadian Representative
Canadian General Electric Co., Toronto, Canada



The Mark of **CARBOLOY**
TRADE MARK REG.

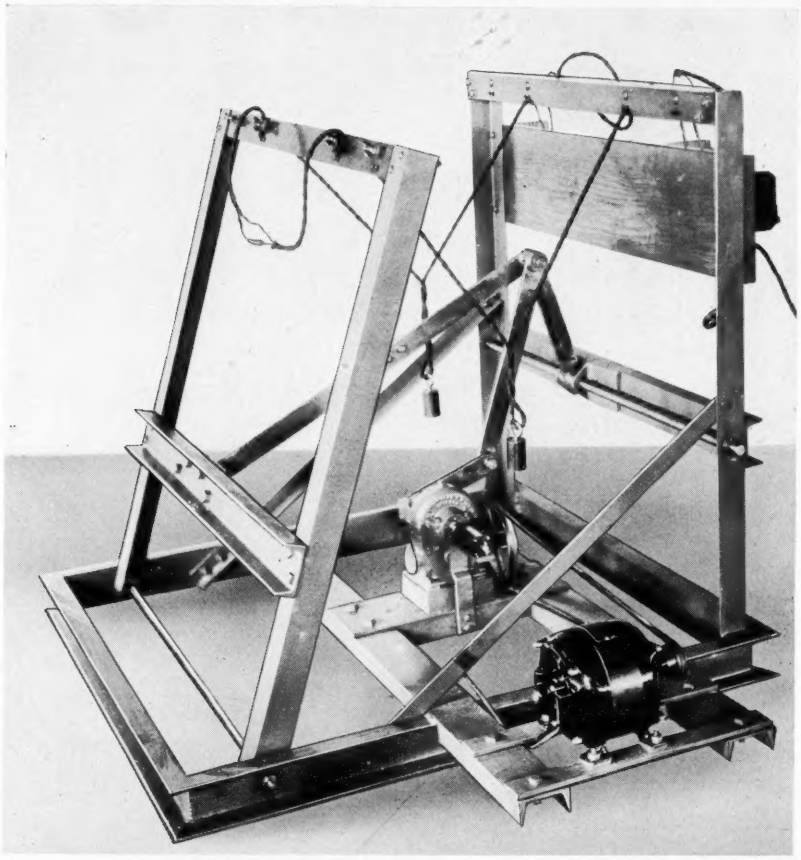
Look for the mark of Carboloy:—if the mark is not on the product it is not a Carboloy cemented tungsten carbide product.

Speed Production with

CARBOLOY

REG. U. S. PAT. OFF.

NEW ENGLAND BUTT HEATER CORD TESTING MACHINE



This testing machine for electric heater cord is accurately designed and constructed to meet underwriters' specifications. It consists of a welded steel base supporting a stationary and an oscillating frame. The drive consists of a 1/4 H. P. motor through a round belt and grooved pulley and a Foote Speed Reducer. An oak board on the stationary frame supports the circuit breaker, small no-load relay, two 7-amp. resistance units and the necessary clips and weights for testing.

OPERATION FOR TESTING

The oscillating frame stretches the cord to its full length and collapses from 18 to 20 times a minute. If any cord being tested should short circuit, the circuit breaker opens and stops the motor. At the same time, if a cord should open up or a wire break, the no-load relay opens and also stops the motor.

The entire circuit when connected is loaded to a 7-amp. capacity by means of and through two heater units which are attached to the terminal board. Accurate tests show that this 7-amp. load is exactly in line with underwriters' specifications.

This heater cord testing machine will prove of real value in assuring the efficiency of cord before it leaves the manufacturer. Write us for prices and complete details today.

NEW ENGLAND BUTT COMPANY

DEPT. W-7, PROVIDENCE, R. I.

CHICAGO OFFICE, 20 NORTH WACKER DRIVE

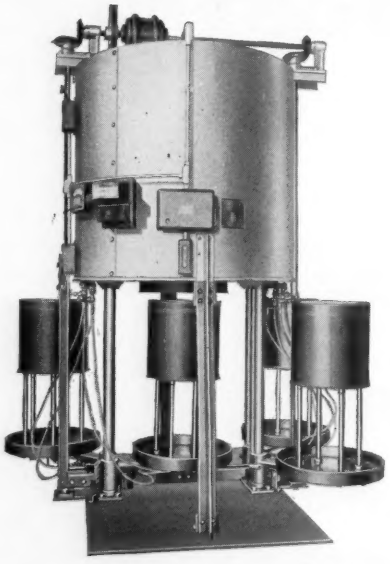
WIRE & WIRE PRODUCTS, Vol. 6, No. 7, July, 1931. Executive office, 551 Fifth Avenue, New York, N. Y. Published by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secretary and Treasurer. Publication office, 49 E. Washington Ave., Washington, N. J. Subscription price: U. S. and Canada, $5.00 per year, 50 cents per copy; Foreign, $7.50 per year. Entered as second class mail at the Post Office, Washington, N. J., under Act of March, 1879. Copyright, 1931, by Quinn-Brown Publishing Corp.

DRINOX

a new, economical and efficient method of dry bright annealing non-ferrous metals

Particularly for those metals so formed that they are preferably kept dry during the cooling period immediately following the heat treatment

FINE WIRE, SPOOLED OR COILED, HOLLOW WARE, SHELLS, ETC.



Compared with pot annealing this method eliminates labor, reduces the annealing period from hours to minutes—gives accurate temperatures and the product is perfect.

Compared with water-sealed furnaces the operation is entirely dry and accurately anneals wire on spools, or other articles which should not pass through a water seal.

The operation is simple, being carried on throughout the day, the four magazines providing sufficient time for cooling, unloading and reloading.

Accurate temperature control, from thermo-couples located **in the charge,** enable the operator to anneal with maximum precision.

Built for—Electric—Oil or Gas Heating.

Requires no foundation, is self-contained and may be located in the line of production.

Gives laboratory results in commercial quantities.

CHARLES F. KENWORTHY, INC.

INDUSTRIAL FURNACES

WATERBURY, CONN.

A Description of the Wire Association Convention and Exhibition Is Given in This Issue of WIRE AND WIRE PRODUCTS

✦ ✦ ✦

AN INVITATION IS EXTENDED TO YOU TO BECOME A MEMBER

✦ ✦ ✦

Annual Dues $10.00 Per Year

A membership entitles you to the following:

The assistance of other members of the Association in solving production questions.
Meetings with men engaged in problems similar to your own and the exchange of ideas.
Participation in technical sessions and discussions and admission to the annual meetings.
The services of the Association information and research facilities.
A subscription to WIRE & WIRE PRODUCTS—the official publication of the organization.
A copy of the annual Buyers Guide and Year Book of the Wire Association.

Fill out the membership application blank below and send it in immediately

---

THE WIRE ASSOCIATION

The undersigned hereby applies for membership in the Wire Association, and agrees to be governed by the Charter and By-Laws of the Society and to further its objects as laid down therein.

Name .....
(*Firm, Organization or Individual applicant*)

Address .....

Nature of Business .....

If corporate membership, name and title of individual who will exercise membership privileges:

Name ..... *Title* .....

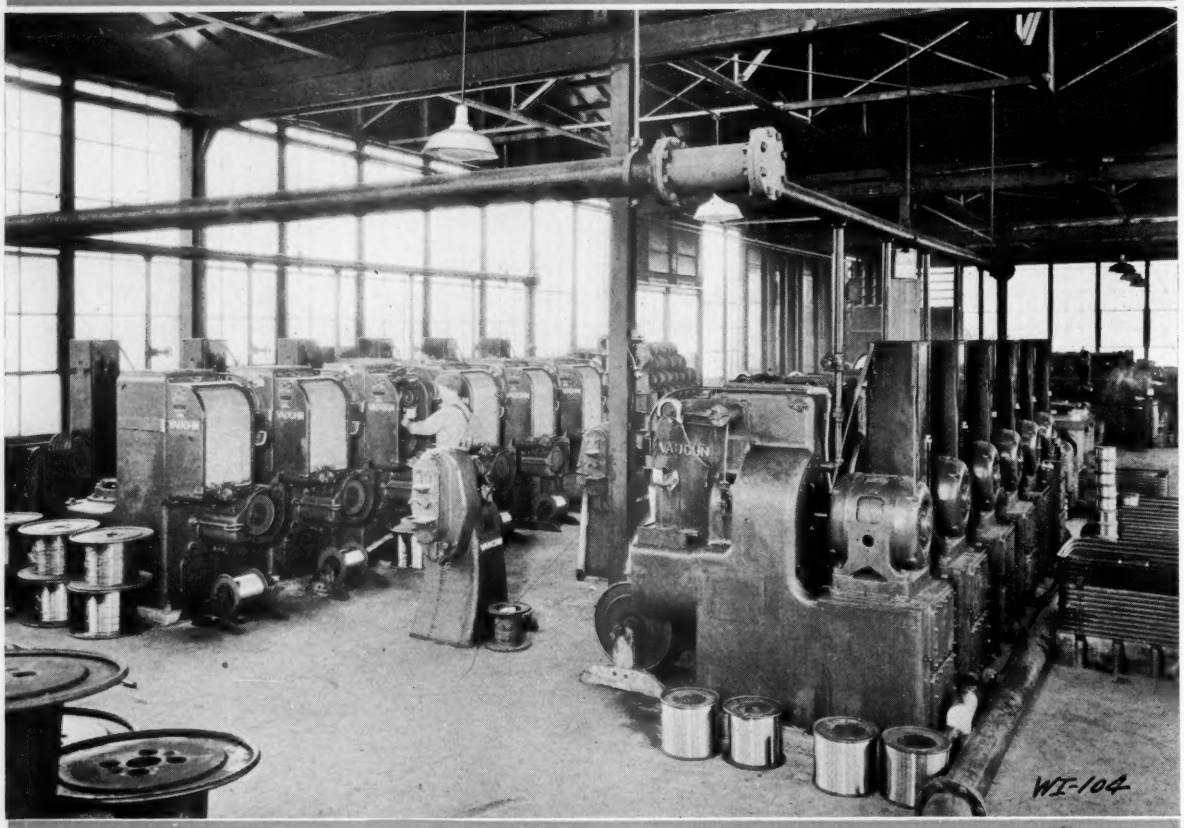
If personal membership, name or organization with which applicant is affiliated and official title or occupation:

Name of Organization .....

Address of Organization .....

Applicant's Title or Occupation .....

VAUGHN



COPPER WIRE DRAWING MACHINERY

REPRESENTS the successful expression of new ideas in terms of definite and satisfactory results. These machines offer a unique combination of superior features such as high drawing speed---increased production---reduced floor space---greater safety, cleanliness and quietness---LOWER COST OF WIRE.

Also manufacturers of Vaughn Motoblocs and other equipment for the production of steel, stainless steel and alloy wire.

THE VAUGHN MACHINERY CO.

CUYAHOGA FALLS, OHIO

WIRE & WIRE PRODUCTS

A monthly publication devoted to the production of Wire & Wire Products in all metals from the bar to the finished wire product.

Vol. 6 July 1931 No. 7

Official Publication of The Wire Association

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are GOOD dies with diamonds carefully selected and uniform in Structure and quality.

SHAPES are designed to give maximum production.

SETTINGS are so firm that they will outlive the dies.

KOEBEL-WAGNER DIAMOND DIES will draw any metal suitable to Diamond Die drawing, and with ECONOMY, SPEED AND UNINTERRUPTED PRODUCTION

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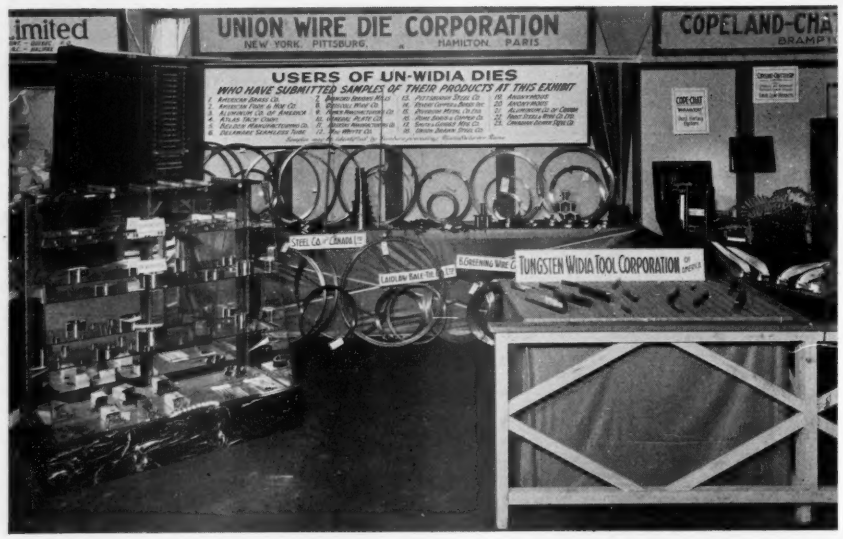
UNION WIRE DIE CORPORATION
NEW YORK, PITTSBURG, HAMILTON, PARIS
USERS OF UN-WIDIA DIES
WHO HAVE SUBMITTED SAMPLES OF THEIR PRODUCTS AT THIS EXHIBIT
TUNGSTEN WIDIA TOOL CORPORATION

UNION WIRE DIE CORPORATION
Exhibit at INFORMASHOW of NATIONAL ASSOCIATION OF PURCHASING AGENTS, AT Toronto, Ontario, Canada.
June 8-11 inclusive, 1931.

WIRE PRODUCTS
UNION WIRE DIE CORPORATION
USERS OF UN-WIDIA DIES
WHO HAVE SUBMITTED SAMPLES OF THEIR PRODUCTS AT THIS EXHIBIT
TUNGSTEN WIDIA TOOL CORPORATION
TUNGSTEN CARBIDE DIE

UNION WIRE DIE CORPORATION
Exhibit at WIRE ASSOCIATION MEETING AND EXPOSITION at Cleveland, Ohio.
June 15-19 inclusive, 1931.

UNION WIRE DIE CORPORATION

NEW YORK

Paris **Pittsburgh** **Hamilton**

WIRE & WIRE PRODUCTS

A Monthly Publication Devoted to the Production of Wire and Wire Products in all Metals from the Bar to the Finished Wire Product.

Vol. 6 JULY, 1931 No. 7

The Wire Association Annual Meeting and Exhibition

Record attendance of men engaged in the production of wire rod and strip and insulated wire and cable at the second annual meeting of the Wire Association. ▼▼▼▼▼▼▼▼

THE attendance of over 500 men engaged in the production of wire and insulated wire and cable at the second annual meeting of the WIRE ASSOCIATION held at Cleveland, Ohio, June 15 to 19, inclusive; and the interest shown by these men in the program of technical papers as presented during the week, as well as their interest in the exhibits of the various types of machinery, equipment, dies, etc., demonstrated beyond the remotest question, the value of such Association annual meetings to the industry as a whole and the very real necessity for such a common meeting ground for the exchange of production data.

✦ ✦ ✦

AS the editor of "Steel" remarks in his comment on this meeting: "No one who followed the program of the WIRE ASSOCIATION or who examined the exhibits of equipment for wire, could fail to be impressed with the extent to which wire has contributed to the advance of civilization.

If the recent activities of the

General View of Exhibits. ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦

TUNGSTEN CARBIDE DRAWING DIES

MASTER PATENTS

REDUCE POWER COSTS

IMPROVE QUALITY

INCREASE DIE LIFE

UNIFORMITY GUARANTEED

Sectional Dies of All Types

MASTER DIE LAPPING MACHINES
AND TEST INSTRUMENTS
ARE AVAILABLE FOR CUSTOMER'S USE
WRITE FOR DETAILS

Master Equipment removes the human element from die manufacture.
Two or two thousand dies may be made identical.

MASTER
WIRE DIE CORPORATION

408 Concord Ave., New York

WIRE ASSOCIATION furnish a reliable criterion, the wire producers are more alert to new opportunities than at any time since the war."

✦ ✦ ✦

THE production of wire is a great industry—a billion dollar industry—and the economic need for reducing production costs and improving processes is always present. This need is the "reason for being" of the WIRE ASSOCIATION, and it is of interest to note that the Secretary of the Association, Richard E. Brown, stated in his annual report before this year's meeting, that during the past year (the first year of the Association's existence) his office handled nearly 900 questions. Of this number, nearly 300 related to processes of production, while over 400 requested information on "where to buy" machinery, chemicals, etc., and the balance of the questions were for general information relating specifically to the production of wire.

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DURING the convention the headquarters of the WIRE ASSOCIATION were at the Hotel Cleveland, and each night the old-timers of the industry would get together and hold informal discussions regarding production processes. The technical meetings were held in the Cleveland Public Auditorium as well as the exhibition and it was found to be a most satisfactory and convenient arrangement for all concerned.

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THESE technical meetings were held during three days of the week of the Show: Tuesday, Wednesday and Thursday and were fully attended. Some interesting discussions developed during the reading of the various papers and these will be published in WIRE AND WIRE PRODUCTS during August and September simultaneously with the publication of the papers to which they relate.

✦ ✦ ✦

THE program presented Tuesday, June 16, to an attendance of nearly 200 was opened with a motion picture—"The Story of Steel", showing the manufacture of rods, rails, etc., together with inspection, cutting and finishing methods.

This was followed by a paper entitled "The History of The Wire Industry", by Kenneth B. Lewis, of the Morgan Construction Co., in which he described for the first time and in his own inimitable manner, the various steps in the development of the manufacture of wire from its crudest form in the centuries past, up to the present-day highly complicated and specialized processes.

This was followed by a paper on "Galvanizing" by W. H. Spowers, Jr., Consulting Galvanizing Engineer, who brought out some new facts of real interest to the industry.

Following this was a paper entitled: "Rust Protection of Wire Products with Cadmium", by Clayton H. Hoff, Engineer of the Grasselli Chemical Company. This paper presented usable facts on Cadmium and was commented on most favorably.

A motion picture entitled: "Steel Wire Products" showing the processes of rolling; of drawing wire, galvanizing wire, making wire fence; winding wire and cold rolling of flat stock and the methods of heat treating annealing, pickling, etc. closed this day's Association program.

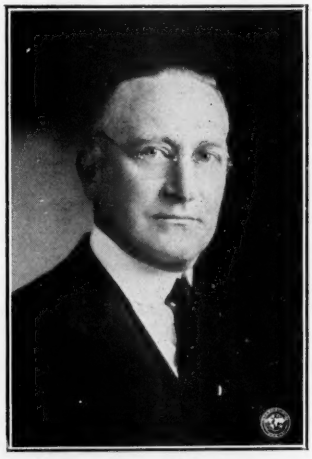
✦ ✦ ✦

ON Wednesday, June 17, the U. S. Government motion picture entitled: "Submarine Cable Laying" was presented, showing in detail the processes of production of submarine cable and its actual use under working conditions.

A paper by Joseph A. Doyle, Vice President of the W. S. Rockwell Company was next presented, entitled "Methods of Heating Wire" and resulted in a most interesting and informative discussion.

Two papers were then presented:

1. "Lubrication", by R. T. Kline, Lubrication Engineer, the J. T. Robertson Company, Syracuse, N. Y.



Vice President
The Wire Association
HERBERT HORSFALL
President and Managing Director
Canada Wire & Cable Co., Ltd.,
Hamilton, Ont., Canada.

President
The Wire Association
JOHN MORDICA
Supt., Rod and Wire Works,
Bethlehem Steel Company,
Sparrows Point, Md.

Vice President
The Wire Association
L. D. GRANGER
Chief Metallurgist,
Wickwire Spencer Steel Co.,
New York, N. Y.

2. "Lubrication and Application To Tungsten Carbide Dies", by C. R. Longwell, Engineer, the Carboloy Company, Newark, N. J.

These two papers started a real discussion which unfortunately had to be terminated due to lack of time to carry through the balance of the day's program.

"Wire Mill Cost Accounting", by L. D. Granger, Assistant to the Vice President and Chief Metallurgist of the Wickwire-Spencer Steel Company, New York, N. Y., was next presented and visualized wire mill cost keeping reduced to its simplest terms. Mr. Granger was asked a great many questions in connection with this paper as it was most informative, being supplemented with lantern slides of charts, etc.

The paper "Wire Mill Management", by E. G. Brown, Asst. Factory Manager, the U. S. Rubber Company, Bristol, R. I., which was scheduled, was not read as Mr. Brown was unable to attend. This paper, however, will be published in full in WIRE AND WIRE PRODUCTS as a part of the Association Proceedings.

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ON Wednesday afternoon, the annual meeting of the WIRE ASSOCIATION was held and at this meeting it was unanimously voted to confirm all acts of the organization committee, the acting Secretary, and the Directors as well as confirming the election of Officers and Directors for the forthcoming year.

A special vote of thanks was tendered RICHARD E. BROWN of WIRE AND WIRE PRODUCTS for his work in originating and organizing the Association and in preparing the program for this meeting and for various other services rendered for the advancement of the Association.

A most unusual, highly interesting and informative feature of the meeting was a talk, by Lieutenant Frank Bullock, Chairman of the War Department Commodity Committee on wire and cable of the Office of the Assistant Secretary of War, Washington, D. C., who gave an address outlining industrial planning for national defense and describing difficulties encountered in the production of wire for the U. S. Army Signal Corps.

Wire Association Headquarters at the Show.

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RICHARD E. BROWN
Secretary, The Wire Association
President, Wire & Wire Products, New York, N. Y.

After this address, moving pictures were shown through the courtesy of the U. S. Signal Corps. entitled "Flashes of Action", showing the activities of the Signal Corps and the use of wire under combat conditions in actual warfare.

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ON Thursday, June 18, a paper entitled "Modern Rod Baking" was presented by R. S. Coulter, Combustion Engineer, of Lebanon, Pa. This proved to be one of the most interesting papers presented and was the basis of considerable discussion.

J. W. Hackett, of the Okonite Company, gave a talk on the manufacture of insulated wire and cable, accompanied by a motion picture film showing the processes and methods followed by Okonite Company in the production of their cables.

A motion picture was next shown entitled "The Story of the Fabrication of Copper" by the American Smelting & Refining Co., showing the rolling of copper rods and drawing of wire; methods of annealing, pickling, washing and drying; method of coiling, cooling, and gauging; making of trolley wire, winding wire; stranding and twisting into cables, and testing methods.

This was followed by another moving picture, "The Manufacture of Wire Rope" showing the

technical processes of the John A. Roebling's Sons Co., Trenton, N. J., including the steel mills, the blooming and rod mills, the wire mills, heat treating and cleaning methods and finally the huge machines fabricating the wire into many different kinds of rope.

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SPECIAL features for the ladies were provided through the courtesy of the Association of Iron & Steel Electrical Engineers as follows:

Monday, June 15,
Bridge Party—Hotel Statler
Informal Reception—Cleveland Auditorium
Tuesday, June 16
Building Arts Exhibit Building. Features, The Home in the Sky
The Home Economic Department
Boat Excursion, Lake Erie
Wednesday, June 17
Trip to Cowan Potteries
Thursday, June 18
Formal reception — Concert, Dance, Cleveland Auditorium, Cleveland, O.
Friday, June 19
Inspection Trip
The Largest Air Ship in the World
The Largest Air Ship Dock in the World.

✦ ✦ ✦

THROUGH the courtesy of the National Broadcasting Company, Station WTAM of Cleveland, Ohio, a radio Broadcast was given by William A. Bennett, Supt., Goddard Works, Wickwire Spencer Steel Company, Worcester, Mass., on the subject of "Wire in Everyday Life". So effectively did Mr. Bennett deliver his address that thousands of people who probably never heard of the wire industry before must now have an entirely new conception of its magnitude and necessity to industry. Mr. Bennett's talk explained how almost every act in our ordinary every-day life was dependent upon articles, equipment or services utilizing wire.

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ALL factors considered it was a great meeting. The exhibitors uniformly reported the making of new and valuable contacts and in many cases actual sales in volume. The wire mill men expressed themselves as well satisfied and the Association secured many new members.

✦ ✦ ✦

THE men who saw the need for an Association among the production men of the wire industry only a little over a year ago—Kenneth B. Lewis of the Morgan Construction Company, Richard E. Brown, of WIRE AND WIRE PRODUCTS and George W. Hartley of Sleeper & Hartley, Inc., should be given full credit for their vision and for their efforts during the past year to develop this meeting to the success it attained.

✦ ✦ ✦

Among the Exhibitors

THE Carboloy Die Sales Division of the Carboloy Company, Inc., exhibited in booths 47 and 48 where were shown equipment for turning, drilling and polishing Carboloy dies. There were also on display, a number of specimen dies and mandrels of various sizes for drawing both steel and copper wire and tubing. Another interesting feature of this booth was the display that showed the evolution of CARBOLOY, beginning with the raw materials, working through to the finished cintered product. Perhaps, for all those that attended the Show the center of attraction was the guessing contest in which was shown a CARBOLOY die with an analysis on the tubing that was drawn through it and the invitation to guess how many feet of tubing had passed through that particular die. The prize for this contest was a matched set of clubs having a True Temper shaft and a G. E. Schavolite head. The winning guess was put in by Mr. D. Mayer, Superintendent at the Metal Textile Corporation in West Orange, New Jersey, whose guess was only 1,000 ft. out of the way. He estimated that 880,000 ft. had passed through the die, while 881,804.61 was the correct figure.

Those in attendance were Messrs. F. E. Koebel, C. J. Koebel, J. R. Longwell, K. R. Beardslee, A. D. Heath, H. G. Macduff, E. R. Duthaler and V. L. Allen.

Exhibit of the Carboloy Company.

✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦

All technical papers presented at the Wire Association meeting in Cleveland, together with the discussions, will be published in WIRE AND WIRE PRODUCTS in August and subsequent issues. These papers and discussions give live up-to-date information on processes of production and will be of interest to every man engaged in the manufacture of wire and wire products.

THE exhibit by William Haddow of the Haddow Die Recutting and Polishing Machine consisted of a 4-head machine in actual operation during the entire week of the show. Many companies, at Mr. Haddow's invitation, brought their own dies for recutting and during the entire week the machine was kept in constant operation doing this work.

The coils of copper wire shown in the foreground of the picture were used for testing the different sizes of dies after recutting.

The 4-head machine exhibited and illustrated is operated by one man. The Haddow machine is also made with 6 heads for two-man operation and it is claimed that the installation of either one of these machines will decrease the die inventory of a plant almost 50%. It is also claimed that with this machine no diamond dust is wasted and further that the dies can be recut 1/10 at a time and wire drawn after each recutting. This in itself results in remarkable economies in the diamond wasted through ordinary methods of recutting. The machine was demonstrated by Mr. William Haddow and one die recutter.

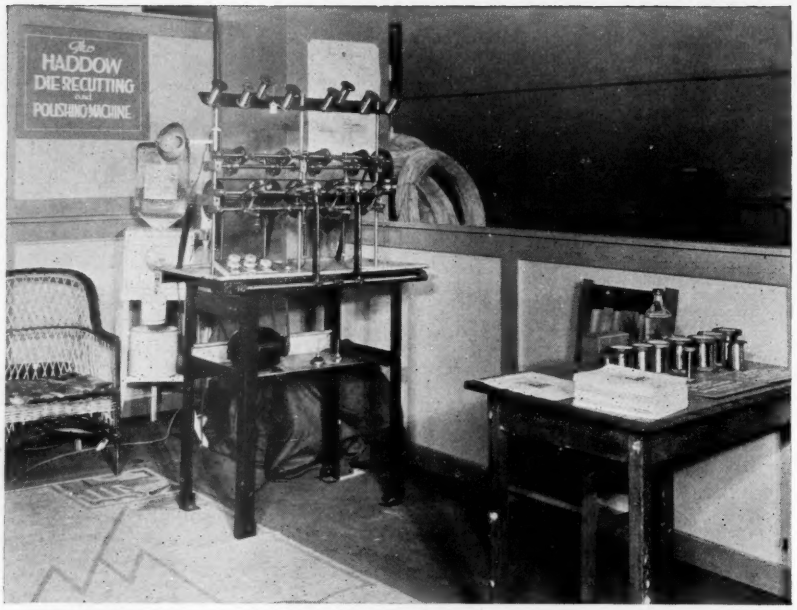

Exhibit of William Haddow.

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AT the exhibit of the R. B. Hayward Co., of Chicago the following equipment was exhibited:

1—78″ x 48″ x 36″ Shipping Reel.

1—72″ x 48″ x 36″ Shipping Reel.

1—54″ x 30″ x 24″ Shipping Reel.

The above three reels were equipped with lagging and are used for shipping insulated cables. They conform to the I. P. C. E. A. Standard Sizes.

1—50″ x 36″ x 26″ Trolley Wire Shipping Reel which may also be used as a Heavy Duty Shop Reel.

1—30″ x 17″ x 9½″ Heavy Duty Shop Reel.

2—30″ x 12″ x 15″ Pressed Steel Chrome Vanadium Shop Reels.

3—Metal Bound Wood Shipping Reels varying from 16″ to 24″ flange diameter equipped with Flanged Steel Drums.

2—21″ x 14″ x 6½″ Collapsible Reels for use on Automatic and Semi-Automatic Welding Machinery.

Various sizes of Flanged Steel Drums were also shown. In attendance Geo C. Hayward and I. M. Wakefield.

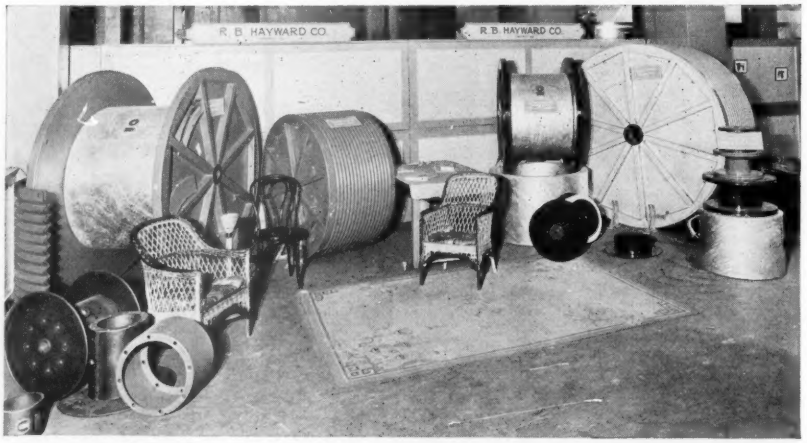

Exhibit of the R. B. Hayward Co.

✦ ✦ ✦

All technical papers presented at the Wire Association meeting in Cleveland, together with the discussions, will be published in WIRE AND WIRE PRODUCTS in August and subsequent issues. These papers and discussions give live up-to-date information on processes of production and will be of interest to every man engaged in the manufacture of wire and wire products.

ONE of the most active spots at the exposition was the booth occupied by Master Wire Die Corporation, of New York, manufacturers of tungsten carbide dies for wire, rod, and tube drawing. Their booth was constantly thronged with interested visitors, who passed many complimentary remarks concerning the exhibit.

The exhibit consisted of samples of five general classifications of the work done by this company. By a series of samples at each stage, the manufacture of tungsten carbide dies was demonstrated throughout the various steps from the component chemicals to the completed dies. Eleven stages of the evolution were shown: the raw materials, tungsten carbide and cobalt, the soft nibs undrilled and unsintered, the soft drilled nibs drilled ready for sintering, the rough dulled sintered nibs, the nibs ground and ready for casings, the cased nibs, hand ripped, the case nibs machine coned, the cased nibs shaped with diamond chips, the cased nibs brough to size, and the completed polished dies.

This portion of the exhibit brought home for the first time to many users of tungsten carbide dies, the realization of the large amount of careful manufacturing required to produce such dies.

The second portion of the exhibit consisted of samples of the company's products in completed dies ranging from seven hole multiple dies size, .009″ through a range of sizes to a 2″ sectional round die together with square, hexagonal, and other shaped dies in various sizes.

Another interesting feature was a complete showing of patented lubricating casings for both wet and dry drawing, those designed for dry drawing containing a water-cooling feature. The general principle on which these devices operate is that of a separate hardened steel die slightly larger than the entering wire, and preceding the die proper. The function of this steel die or "grease plug" is to impregnate the surface of the entering wire with lubricant. The annular space around the wire formed by the mouth of the actual die becomes filled with

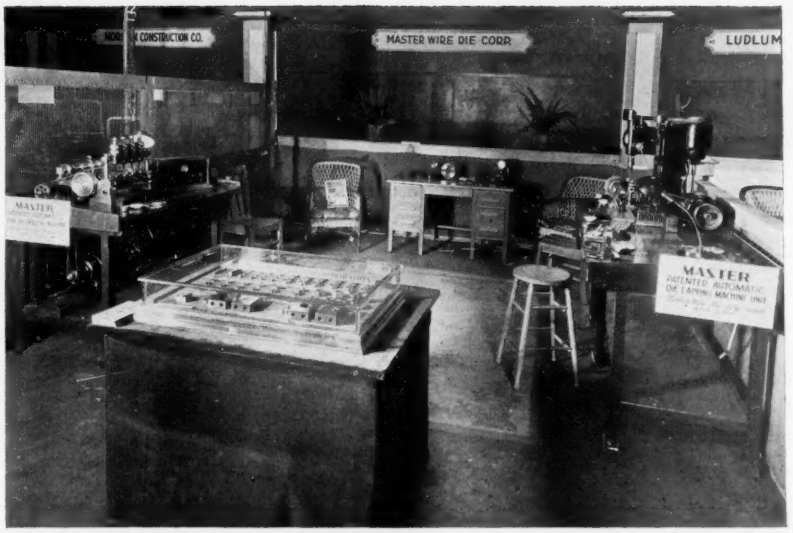

Exhibit of Master Wire Die Corp.

lubricant under heavy pressure which further increases the impregnation of the wire surface. It has been shown by actual tests that the wire pull on the same die is decreased between 15 and 17% when the die is operated in connection with this special holder.

One line which called for much favorable comment was the set of die testing instruments, which are special dynamometers manufactured by this company for checking dies, by amount of die pull both on and off the wire drawing machine. These are rugged instruments, precision made, and operating on hydraulic principles.

The main features of the exhibit insofar as attracting the crowds were concerned were the two die lapping units on which dies were being actually manufactured and shipped to customers during the show.

Tungsten Carbide Dies are no longer a novelty and have shown by feature performances in many mills their possibilities. The great drawback has been lack of uniformity in performance between different dies, and lack of ability on the part of die manufacturers to duplicate dies which have given brilliant performance. It is comparatively easy to determine the entrance angle and length of bearing required for any particular drawing job, but it has been very difficult to produce exactly a predetermined shape in a die or to make a quantity of dies exactly alike.

The two units in the illustration are the answer of the Master Wire Die Corporation to this problem. The machine on the left is their brand new fine die drilling machine. It is designed for drilling four dies at a time, and automatically redresses the drilling needles to the angle required during 20 seconds of each minute of operation. A constant angle is thus maintained in the die. The needles reciprocate electrically while revolving, by an ingenious use of solenoids, and the amount of movement may be regulated for each needle by the rheostats on the panel board shown on the side of the machine. This machine makes exact duplication of tungsten carbide dies for fine wire possible.

The die lapping unit shown at the right for lapping and finishing tungsten carbide dies to the exact angles and bearing length required on die sizes of .020 and up.

The lapping machine operates on the patented principle of using the diamond-charged side of a rotating and reciprocating needle as a lap through the die, lapping the entrance and back angles at the same time, and assuring an accurate angle, lathe shown is for finishing and polishing purposes only.

The Booth was attended by Messrs. A. Simons, Theodore B. Smith and F. M. Woodford.

CONSIDERABLE interest centered round the exhibit of The Lewis Machine Co., Cleveland, O., where fielding rod was being straightened and cut at the rate of 160 pieces per minute. This production from a new heavy-duty 3/8" capacity special welding rod straightening and cutting machine attracted the attention of the wire mill men who visited the exposition. Approximately four ton of wire was delivered to the booth in coils, straightened and cut into 14" lengths, and boxed for shipping.

A special feature of the exhibit was the welding together of the ends of the coils which eliminated any waste of wire. The welding was done on a new B-90 Butt Welder manufactured by the Taylor-Winfield Corp.

Exhibit of the Lewis Machine Co.

Personnel in charge of exhibit were—M. W. Lewis, President; C. B. Jones, Vice President; E. P. Mosle, Superintendent, and George Hessdoerfer, eastern representative. Mr. Marion of the Taylor-Winfield Corp. had charge of welding.

THE Morgan Construction Company of Worcester occupied booths 37, 38 and 39 and exhibited, as at Buffalo last year, the Morgan-Connor Wire Machine with air cooled blocks.

The machine was a five-holer of type "B", a size and type which accounts for about 50% of the Morgan-Connor machines in service in this country and in Europe. This machine has ripping and intermediate blocks 16" in diameter, and may be equipped with either a 16" or a 22" finishing block. Working from No. 5 rod in basic or Bessemer steel, its common range is 4-draft wire finishing 12 to 13½ gauge, and 5-draft wire from 13½ to 15½. European mills working from a slightly smaller rod, commonly 5-hole to 16½ and 17 gauge. Patented stock for spring and rope wire is usually brought to this machine at No. 7 to No. 10 gauge.

An operator was in attendance, and the machine drew wire throughout the entire period, drawing basic wire rods at No. 5 gauge to No. 14½ wire. About 12,000 lbs. of wire was drawn during the week. While the usual finishing speed for this size and grade on the "B" machine is 650 to 750 feet per minute, the machine's speed was reduced to 500 feet per minute for easier demonstrating, and in place of the usual 40 h. p. motor at 1200 r.p.m., a 30 h. p. motor at 900 r.p.m. was employed. The standard accessories, stripping equipment, safety stop, motor driven blower, and motor driven pointer were in service.

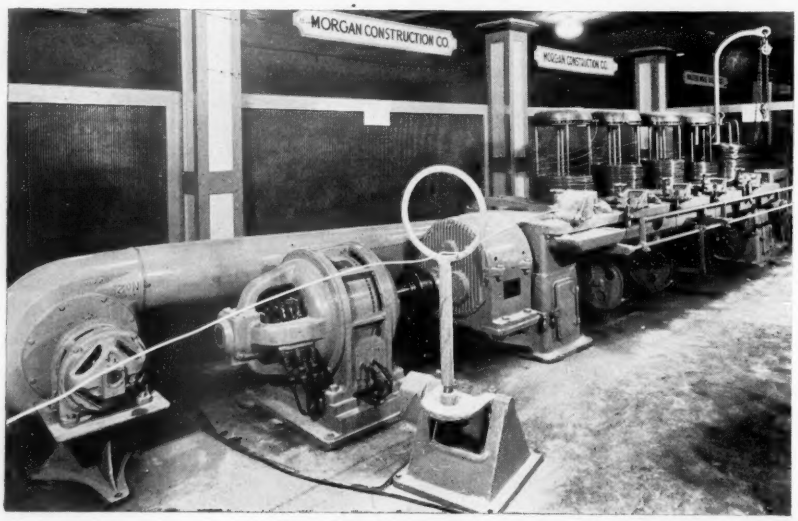

Exhibit of Morgan Construction Co.

These machines are so well known among the steel wire mills, that visits of steel men to the Morgan booth were chiefly to renew acquaintance and exchange production records, but several members of the Wire Association whose interest lies on the non-ferrous side were impressed with the possibilities of this unique drawing process and its adaptability to some of the stainless steels was also frequently under discussion.

Those in attendance were Messrs. Kenneth Lewis, P. Alden Beaman and W. E. Carroll.

In the August issue of WIRE AND WIRE PRODUCTS Mr. G. K. Rylands of Rylands Brothers, Ltd., takes issue with Mr. Whitehead and presents some criticisms and information of real value to metallurgists and engineers engaged in the galvanizing of wire and strip.

THE Micro Products Company of Peoria, Illinois exhibited a model E "Micro-Weld" machine that perfectly butt-welds wire from No. 4 to No. 20 gauge with Micrometer precision.

They also exhibited a model T for stock from ¼" to ⅝" in size. This model weighs only 100 pounds and has a 7 kw capacity. Either model is available on a truck where mobility is desired. This company also manufacturers a special type of welder for copper, aluminum, zinc, etc. This is a flash-welder that completes the weld in a vacuum that eliminates the occlusion of oxides and avoids the characteristic granular burr of oxidized welds.

The exhibit was in charge of D. K. Hopkins, Chief Engineer.

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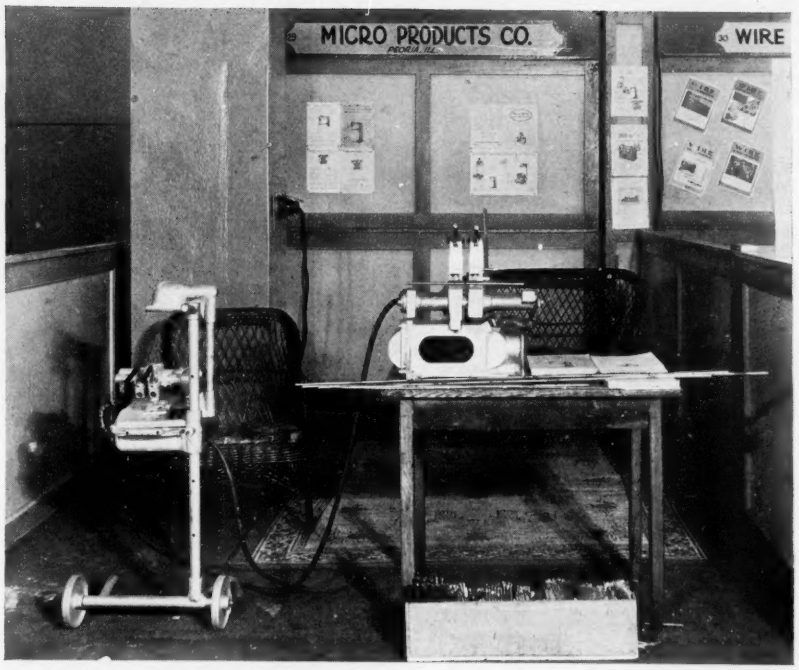

Exhibit of Micro Products Co. ✦ ✦ ✦ ✦ ✦ ✦ ✦ ✦

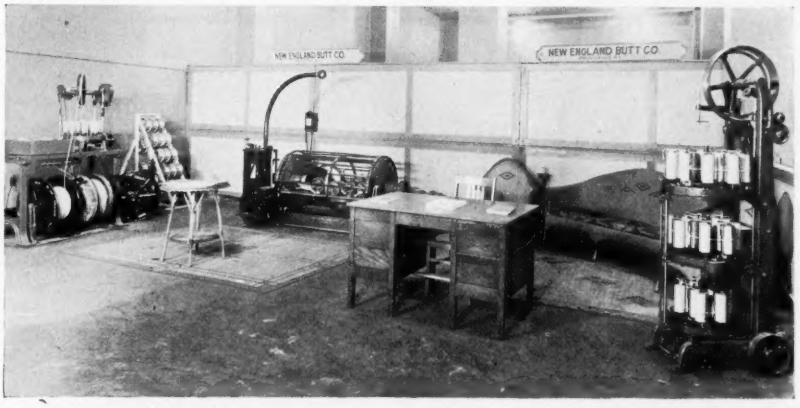

Exhibit of New England Butt Co. ✦ ✦ ✦ ✦ ✦ ✦ ✦

THIS exhibit consisted of a Weatherproof Braider shown on the extreme right of the photograph, and designed to carry packages, 2-1/4" diameter by 6" traverse. It is arranged with a 12-carrier deck on the bottom, 16-carrier deck in the center, and a 20-carrier deck at the top. This braider is the latest design with one piece upright and leg on each side, supporting the various base groups which may be readily removed.

This machine is equipped with an 18" capstan and clutch pulley drive. The stop motion operates with very little effort.

The machine in the center of the photograph is the new High Speed Bunching Machine.

This new buncher has been developed to give greater flexibility to the operation of bunching. It runs at a speed of 900 r.p.m. and will produce 4500 to 36,000 feet of wire per hour. It is completely mounted and can be easily moved to various locations in the plant. The machine is geared to make two twists to one revolution of the motor, producing 1800 twists per minute. The reel is 19" in diameter by 8" traverse, having a capacity of 350 pounds. Change gears are furnished to give lays from ½" to 2" in ¼" step.

This Buncher is driven by a two horsepower motor through Pyott V belts and equipped with a drum control, resistance unit and a stop and start station. A brake, controlled by a foot lever, is located near the drum control in a convenient position for the operator. A davit is furnished to mount a hoist unit to facilitate removing and loading the large reel in the cradle.

The machine on the extreme left of the photograph is a 16-carrier braider mounted on frames, beneath which is supported tilting reel stands for bare and finished wire, the finished wire reel being driven from the cross shaft of the braider. The braider is also equipped with a 14" angular sheave which helps to guide the wire in an easy manner by the traverse motion. This sheave is secured beneath the rails of the frame, and is also driven by pawl and ratchets with lever connection to the driving unit of the finished wire reel.

In attendance during the show were Charles S. Barningham, Sales Manager and W. A. Richards, Western Manager.

THE center of interest in the exhibit of Sleeper & Hartley, Inc., of Worcester, Mass., manufacturers of wire drawing and spring coiling machinery of every description, proved to be the eight-draft double-bank fine wire drawing machine. The exhibit was in charge of Wm. H. Blount, sales engineer.

This machine, which, with two spring coiling machines, was in constant operation, was surrounded at all times by groups of mingled experts and mere spectators, all of whom were free in their praise of the quality of the wire produced. The machine was drawing mild steel weaving wire from .036 down to .015″ in seven drafts through Carboloy dies supplied by The Carboloy Co., Inc. The first six drafts were under soap solution.

Eight-inch finishing blocks were used on this machine, the speed of which had been reduced one-third, the normal speed of drawing being 750 feet per minute per head. A 3 H. P. motor was used, being mounted on the top of the machine where it was easy to attend and away from the danger of wet and dirt.

Sharing in the attention accorded the Sleeper & Hartley exhibit were two standard spring making machines, a No. 1 Universal Spring Coiling Machine and a No. 1 Torsion Spring Winding Machine. Both machines were direct motor-

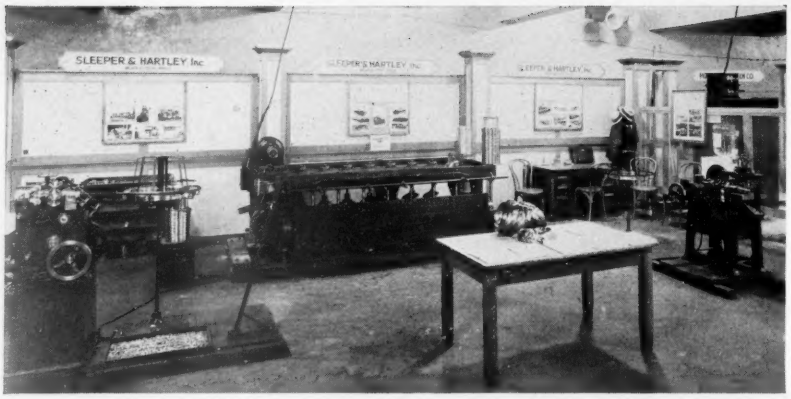

Exhibit of Sleeper & Hartley, Inc.

driven and formed 17½ gauge hard-drawn brass spring wire into a wide variety of coils.

The Universal Spring Coiler, despite the fact that it has appeared in every Sleeper & Hartley exhibit in recent years, still continues to attract wide attention. Under the expert guidance of Henry Nigro, of the Worcester plant, adjustments were altered while the machine was in operation and the spring forms ran the gamut under the eyes of the spectators. It was interesting to note that the bin, into which the finished springs were placed, was kept nearly empty at all times due to the inroads of spectators who took numerous "samples", which was as it was meant to be.

On the other side of the space formed by the joining of Booths 33, 34 and 35 was to be found a Torsion Spring Winding Machine. This machine, winding 35 springs of 12 coils per minute, laid one end of the spring across the center of the coils while the other end, over one inch long, was placed tangent to the coils and was also bent. This machine presented an extremely neat appearance, the bright work being hand-finished as befitted an exhibition machine while the motor-mounting between the legs was simplicity itself, a clutch being interposed.

Mr. Blount was kept extremely busy at all times answering questions and meeting many acquaintances in the Wire industry. At several times the booth was so crowded that persons had to take turns in getting up to see the operation of the machines at close range.

THE exhibit of the Union Wire Die Corporation displayed the variety and multitude of dies of various shapes and types manufactured by them.

These dies ranged in size from .0048″ in diameter up to 3″ in diameter. The 3″ diameter die shown in the illustration is of the sectional type and is to date, the largest die of tungsten carbide, ever manufactured. This particular die contains 28 lbs. of Widia metal. The total weight of the die complete is 165 lbs. The die is manufactured for the purpose of drawing oil well tubing. Among the other dies exhibited of the sectional type were commutator dies, square dies and hexagon dies.

Exhibit of Union Wire Die Corporation

Dies used in various classes of press work for the manufacture of eyelets, ferrules and different forms of metals cold drawn on a press, were also shown.

The machinery exhibited was simple in its operation and reasonable in price, showing that the manufacture and working of Tungsten Carbide dies does not necessitate expensive equipment.

The quality of the work produced on this machine was well illustrated in the dies on display and the quality of material drawn by these dies was also shown by the various samples of wire exhibited.

Outstanding amongst these exhibits of steel drawn by various concerns in the United States, was that of the Pittsburgh Steel Company, while Canada was well represented by the exhibit of the Aluminum Co. of Canada. The copper industry was also well represented. Some exceptionally fine wire drawn by the American Brass Company, Belden Mfg. Co., and Chase Brass Co., being part of this section of the exhibit. Included were also a number of fine samples of shapes of various types drawn by the above mentioned concerns. The possibilities of the tungsten carbide die was brought home very forcibly by the exhibit of chromel wire and stainless steel tubing produced on these dies.

L. C. Jacobson, Sales Manager, New York; H. B. Clark, Dist. Manager, Pittsburgh; E. Roth, New York. W. D. Bronson, Pittsburgh, and J. F. Huffman, Cleveland were in attendance thruout the entire show.

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VIANNEY Wire Die Works, 100 Fifth Avenue, New York City with French plants located at Trevoux, Vezeronce and Le Creusot exhibited wire drawing diamond dies in sizes ranging from .00039 to .100.

Diamond, as everyone knows, is unexcelled for drawing all metals and the use of carbide dies has not dislodged it from its position; indeed as could be noticed on the picture in the Vianney booth, 52,-275 diamond dies had been sold in the U. S. A. and Canada alone by that concern from 1926 to 1930 inclusive.

In the next show case, Ramet Tantalum Carbide dies, manufactured by Ramet Corporation, a subsidiary of Fansteel Products Co. of North Chicago, Ill., were also exhibited by Vianney who drills and finishes Ramet dies by special agreement. This exhibition consisted not only in dies running from .010 to .350 but also in Ramet tools and special shapes of Tantalum Carbide for all purposes. The Ramet dies, we are told, have been very successful on hard metals such as high carbon steel wire, etc.

In the third show case, Vianney also exhibited imported Tungsteel dies (tungsten carbide) shaped exclusively for copper. These attracted the attention of most of the officials of copper wire mills and visitors at the exhibition as Vianney is producing all copper sizes down to .0225 without difficulty.

In attendance, Mr. Victor Boulin and Mr. Eugene Franklin.

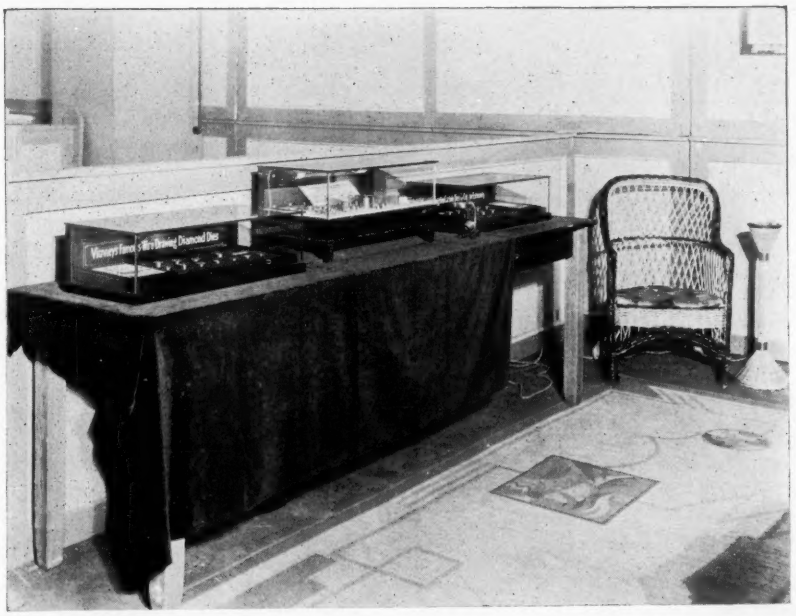

Exhibit of Vianney Wire Die Co.

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AMONG the exhibits at the Convention which are not illustrated in the descriptions were those of the Sefton National Fibre Can Company of St. Louis, Missouri, who displayed their new improved fibre non-returnable wire and cable spools and reels.

These spools are designed for winding the lighter grade of insulated wire and cable and it is claimed that they can be purchased at such a low cost that the mills can use them on a non-returnable basis. The exhibit was in charge of Mr. Arthur Grace, Sales Manager.

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THE Firth Sterling Steel Company, exhibited their new line of "Firthite" Tungsten Carbide Dies in many sizes and shapes.

This exhibit attracted a great deal of attention during the week of the show.

Stuart C. Lawson, Sales Manager, and E. M. Reilly, Jr., Sales Engineer, were in charge.

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IN connection with the exhibit of the Master Wire Die Corporation, and immediately adjoining, was the exhibit of the Ludlum Steel Company, who displayed the raw materials from which the complete Tungsten Carbide die was made, the finished dies being displayed at the exhibit of the Master Wire Die Corporation.

No Rejects

Personalities and Gossip of the Wire Show as Told by a Roving "Trouble Shooter" ▼ ▼ ▼ ▼

THE tumult and the shouting has died! Sleeper-Hartley and Morgan Conner machines have gone back to regular work on rods and wire that are not handpicked and the Lewis Straightener has been given solitary confinement for disturbing the peace. The die men who were anything but dead in proclaiming the virtues of their particular wares have gone back to working for a living or playing golf.

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ON the whole the show was a real success. It was excellently planned and managed and the fellows who did the hard invisible work which made it possible should be given thanks and credit for splendid effort. As shows go and especially shows in this year 1931 it stands away out in front, no one was more than ordinarily overcharged, and all talked of the wonderful prospects ahead. If Hoover wants to do another good turn he should bend his efforts to the wire industry and suspend a few debts for wire men and wire buyers.

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IT must have been gratifying for those men who fathered and mothered the idea of a wire association to have witnessed the turn out for the meetings that took place. Even though the membership has been steadily increasing the actual test of approval lay in meeting attendance. And boy it was a grand and glorious feeling to know that the association sponsors were getting a just reward for their vision. The early comers felt guilty-like when they tip-toed to their seats in the spacious meeting room. They were only partially re-assured when they recognized the priestly countenance of Father John Mordica of Sparrows Point but on seeing the benign dominican bald-pate of Frére Granger of Wickwire, they were certain that they had come to church.

I am sure that the future will continue to see the wire industry taking the lead in the discussions which are of such vital interest and that the men whose knowledge of the industry is first hand, will present everyday mill problems of pregnant interest for discussion. ✦ ✦ ✦

CAN anyone imagine what would have happened to Kline of the Robertson Co., if upon investigation his exhibit marked A should have been found to be Lifebuoy. For all the use he would have been to his boss from then on, I wouldn't give you an exhibitor's pass. He could easily have become a general in the army of the unemployed without half trying. Doc. Braley of Mellon Institute was far from kind to even remotely hint that internal pressures in dies could have any relation to lubricant pressure resistance. Why the man hadn't even prepared a paper; rank heresy, I calls it!

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THERE was one fellow, that Cadmium guy, who surely paid us for listening to him. Those useful cadmium plated wall gadgets were put into service immediately after the meeting. Spowers didn't talk as much about dross this year as he did last and I for one was quite disappointed. The first reel had been so interesting. When Hoff of Grasselli Chemical gave out those sample Cadmium plated corkscrews and bottle openers, everybody had an idea that when Longwell of the Carboloy Co. spoke he would give away sample dies. But alas, there has been a change in company policy and we had to listen without any apparent reward. To cap the climax a guy named Clark from Union Wire Die summed up brilliantly by saying that Tungsten Carbide dies ought to work. Callahan of the Steel Co., of Canada brought the meeting back to earth with a story about a friend of his who had several operations, each successive one to correct an evil caused by a previous one. It was a great party!

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FAR far into the night the wire industry, its future and past, was discussed by men who have lived with it for generations. Briening of Pittsburgh Steel, flanked by a fact finding and tasting commission drank it all in to see if they could learn what the limit of distress is, if any. Abe Walker of Youngstown kept on protesting he had to get home to put the baby to bed. (Aged twenty one). Charlie Kempert of Newburgh Works reminisced about the old baseball days, Ben Spaulding of Northwestern shook hands and swapped stories with Walter Stone of Republic Grand Crossing, Chicago. Hitchcock of Atlantic Wire Co., Branford, Conn., didn't dare go home until his wife's parting instructions were complied with, to wit: "Don't you dare come home until you run over to Detroit and see that daughter of yours! (Daughter has been married more than six weeks and has moved to the automobile city.) Thompson of Gulf States Steel, Alabama City, Ala., slept in The Cleveland Athletic Club and complained that he couldn't stand the heat of Cleveland.

On the elevator in the Hotel Cleveland was heard the following: "I don't see how I could have won the golf clubs, I don't even remember guessing."—'Oh, come now Mr. Mayer, of course you guessed'. ✦ ✦ ✦

BUT it was a good party and even the exhibitors got a break, which evens things up pretty well. The heat was not so oppressive as it was last year, the city of Cleveland did themselves proud with their auditorium and as a member of the wire association I am truthfully surprised to witness so much progress in one short year.

Corrosion Resistance of Aircraft Bracing Cables With Different End-Connections

By Martin Abraham

Dr.-Ing., Research Engineer, Deutsche Versuchsanstalt für Luftfahrt, Berlin-Adlershof

The official report of the Deutsche Versuchsanstalt für Luftfahrt, giving the result of experiments to determine the corrosion resistance of airplane steel wire rope with metallic coatings as well as with different types of end fittings.

BRACING Cables in airplanes and dirigibles while evidently attacked by rust to a certain degree sometimes proved still to possess much higher tensile strength than was expected from their appearance. On the other hand, rusty cables broke in a number of cases under service conditions. In splices, the loss of strength due to corrosive attacks appeared sometimes to be less pronounced than in the straight portion of the cable. But experience has shown that the exterior of a cable cannot be relied upon in judging the actual progress of corrosion in it. On account of the extreme importance of all bracing cables as structural members of airplanes and dirigibles, it was highly desirous to bring some light into all these questions. A number of various cables were therefore subjected to severe corrosion tests in the German Aeronautical Research and Testing Institute.

SOLDERED end-connections, frequently used on aircraft bracing cables, are said to be particularly liable to rust on account of the chemical action of the remainders of the hydrochloric acid which is generally applied prior to soldering. Patent fittings, however, as those fastened to the cable by means of cold drawing promised an especially good behaviour as regards corrosion. These two kinds of end-connections were therefore tested as well for their corrosion resistance, apart of the usual splices.

In the following, all the details and final results of these corrosion tests are reported.

I. Cables Used for the Experiments

A FLEXIBLE steel cable, 0.165 in. (4.2 mm) in diameter and consisting of 37 wires was chosen for the experiments. The construction of the cable was to be in accordance with the German Standard Specification 4.2 DIN L 8, which is nearly the same as British Standard Specification 4 W 2, item 45, while American aircraft bracing cables are made of 19 wires only, according to Navy Department Specification 49 C 5.

The cable for the experiments was to consist of

an outer layer of 18 wires,
with a clockwise pitch,
a middle layer of 12 wires,
with a clockwise pitch,
an inner layer of 6 wires,
with a counterclockwise pitch,
laid around
1 central wire,
i. e. 37 wires total.

All wires composing the cable were to have a diameter of from 0.023 to 0.024 in. and an average tensile strength of 285,000 lbs. per square inch.

Types of Wire Used

In fact, three different types of wire were used for the manufacture of the experimental cables:

a) a steel wire coated with pure zinc by the hot process, as customarily applied for the manufacture of standard aircraft cable;

b) a steel wire coated with pure cadmium by the Udylite process;

c) a stainless V 2 A - steel wire, furnished by Fried. Krupp A. G., Essen.

From each of these three wires a cable as described above was made in the same works and under absolutely equal manufacturing conditions. The cables were tested after delivery, the results obtained are given in Table 1.

Table 1

Results of Tensile Tests on the Experimental Cables

Cable	Average Diameter of Wire, Inch	Average Breaking Load of Wire, Pounds	Average Tensile Strength of Wire, Pounds per Square In.	Average Diameter of Cable, Inch	Average Breaking Load of Cable, Pounds
Zinc Coated	0.0234	122	285000	0.165	4500
Cadmium Coated	0.0239	136	304000	0.169	4760
V 2 A Steel	0.0234	115	266000	0.165	4010

2. End Connections

IN order to gain information about the resistance of various end-connections against corrosion attacks, samples of each of the three experimental cables were provided with three different types of terminals, as shown in Fig. 1. Every individual sample was fitted with equal terminals at the two ends.

A. Sleeve Fittings

Sleeve fittings of the Vereinigte Deutsche Metallwerke A. G., Heddernheimer Kupferwerk, Frankfurt (Main)-Heddernheim, according to German Patents Nos. 388871 and 435274. These terminals when finished look very similar to the "Tru-Loc-Fittings" of the American Cable Company. While, however, the "Tru-Loc-Fittings" are pressed on with a hydraulic press, these German end-fittings are fastened to the cable by cold drawing through a wire die, which can easily be done in a small hand operated draw bench. The shape and dimensions of the fittings before drawing as applied in this case are seen in Fig. 2. They are made of carbon steel containing approximately 0.35%C and less than 0.8%Mn, the tensile strength of the normalized rod being about 85000 lbs. per sq. inch. By the drawing process, the outer diameter is reduced from 0.394 to 0.323 in. and the metal of the sleeve cold flows into the interstices of the cable, thus locking the end-fitting securely to the cable.

THE sleeves with the bore 2 ins. in length were used for the **zinc coated** cables and proved well: in the tensile test, all ruptures occurred in the middle of the sample, at a load corresponding to the real breaking load of the cable (see Table 1). The sleeve fittings, therefore, when used in connection with the zinc coated cable can be regarded as terminals of 100% efficiency.

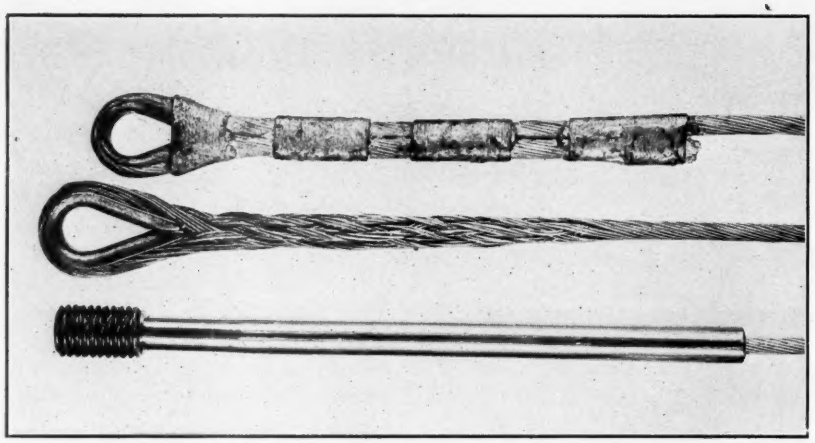

Fig. 1. Different End Connections for Aircraft Bracing Cables. (a): Sleeve fitting. (b): Splice (serving wire removed). (c): Soldered terminal.

WHEN the same sleeves were applied to the **cadmium coated** cables, the adhesion was insufficient and, in the tensile test, the sleeves slipped from the cables. Longer sleeves were therefore tried, with a bore 2¾ ins. in length (see Fig. 2), but even then all cadmium coated cables could be pulled out, the maximum loads carried still being from 12 to 16% lower than the breaking load of the cable (for individual test results, see Table 3). The fittings had been pressed on to the cadmium coated and zinc coated cables under absolutely equal conditions. The average cable diameter was even somewhat larger in case of the cadmium coated cable, so that the compression should have been rather higher than on the zinc coated cable. The fact that in spite of this and in spite of the longer bore the fittings slipped from the cadmium coated cables while they held on the zinc coated ones until the cables broke, indicates that the specific adhesiveness of these fittings is much greater on zinc coated than on cadmium coated cables. This must be due to the greater softness and therefore smaller frictional resistance of the cadimum coating, which evidently acts as a kind of lubricant between cable and sleeve. Perhaps, the difference in coating methods may also partly account for the great difference in hardness. The hot process would probably produce a much harder coating than the purely chemical Udylite process applied here. The melting point of cadmium is as low as 321 deg. Cent. as compared to 419 deg. Cent. for zinc. It should, therefore, be just as easily possible to produce an even cadmium coating on steel wires by dipping them into the molten metal. A cadmium coating of somewhat greater hardness would not only increase the adhesiveness of the sleeve fittings but also the resistance of the cable against mechanical actions. Another solution may possibly be found in removing the soft cadmium coating from that part of the cable which is to be inserted into the sleeve. This could be done by carefully heating the end of the cable to the melting point of the cadmium. By application of sleeves with still longer bores, one would, even with the soft cadmium coating, no doubt finally come to a size which would also offer sufficient adhesion to render slipping impossible. But any such fitting larger than the ones applied here must be considered too long and too heavy for practical use.

THE **V2A—steel** samples with sleeve fittings when tested all broke either at the open end of the sleeve or, very near that point, inside the sleeve. These ruptures occurred under loads which were from 4 to 12% lower than the real breaking load of the cable. None of the V2A-samples slipped out of the fitting. This is quite in accordance with what could have been expected after the above

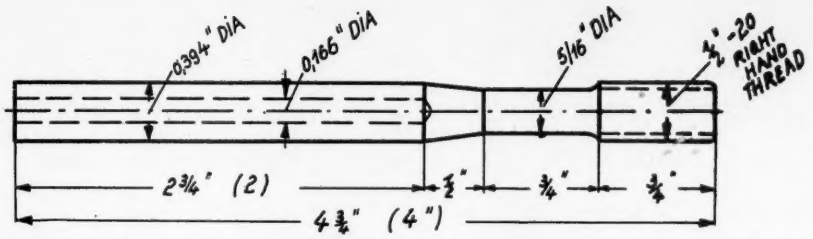

Fig. 2. Sleeve Fitting for Aircraft Bracing Cable of 0.165 in Diameter.

mentioned experiences. The specific adhesiveness of steel on bare steel must be greater than of steel on zinc or even cadmium, under otherwise equal conditions. Very probably, it is too great to give good results in this case. The only possible explanation for the premature ruptures of the V2A-samples can be found in the drawing operation. After the first drawing, the steel sleeve must have been already in such close adhesion to the outer layer of wires that in the second, third, or fourth drawings some of the outer wires had to follow the elongation of the steel sleeve, thus either gliding over the wires of the middle layer and straining them or elongating themselves until some of them broke. There can be no doubt that during the drawing operation a number of wires were broken or at least weakened inside the fitting so that, in the tensile test, the fittings were not able to carry the full breaking load of the cable and the samples broke prematurely at, or in, one of the terminals. In a systematic series of further experiments, it is intended to apply either shorter sleeves or less cross-sectional reduction in the drawing operation, or both, in order to find the necessary conditions under which no wire is unduly strained and at the same time sufficient adhesion obtained.

One could just as well think of giving the ends of the V2A cables a coat of zinc before the sleeve is slipped over. In any case, for the cadmium coated as well as for the V2A steel cables, the 100% efficient sleeve is only a matter of further experiments. It would be very desirable finally to find a solution which allows of applying the same sleeves for one particular seize of the cable whether it is composed of bare or any type of coated steel wire.

B. Splices

Splices were made in the usual way with thimbles, (as seen in Fig. 1, b), and served with fine, soft annealed, and galvanized steel wire cable. In the tensile test all samples broke at the end of one of the two splices. In fact, the ends of the two splices must necessarily be the weakest points of a spliced cable. The reason is this. Any other cross section of the splice except the very end contains a greater number of wires and is, therefore, stronger than the straight cable. At the end of the splice, the number of wires is again the same as in the straight portion of the cable, but, at that point, the outer wires have been bent off more or less sharply from their normal location in order to enable the wire ends of the free end of the cable to be stuck through. Under load, the outer wires will, therefore, be stressed more than the others at that point and always break ahead of them. The ultimate loads at which this occurs are from 10 to as much as 30% lower than the real breaking load of the cable. It is especially inconvenient that, in most cases, one cannot tell from the appearance of a splice whether it is a good one, i. e., whether the unavoidable loss in strength is as small as possible. This, nevertheless, depends largely upon the skill and reliability of the splicer. Many good splicers furnish all their splices with equally little losses in strength although, even to a severe inspector, those good splices may hardly appear any better than others, much worse ones.

Table 2 contains the breaking loads of splices in the three experimental cables.

C. Soldered Terminals

In making up soldered terminals, the cable was bent around the thimble and served with 1/32" soft annealed, galvanized steel wire cable. The serving was done in four separate sections; in each of them, the two ends of the

Table 2

Tensile Strength of the Experimental Cables as Spliced
(3 equal samples of each cable; for individual results, see Table 3).

Cable	Average Breaking Load of Cable Pounds	Breaking Load of Splice		Loss in Strength Due to Splicing	
		Minimum Pounds	Average Pounds	Maximum %	Average %
Zinc Coated	4500	3900	4060	13.3	9.8
Cadmium Coated	4760	3970	4080	16.6	14.3
V2A Steel	4010	3370	3510	15.9	12.5

wrapping cable were twisted together. The served portions of the terminal were then wetted with soldering fluid, by means of a paint brush. The soldering fluid consisted of concentrated aqueous zinc chloride solution produced by dissolving a saturation quantity of zinc sheet in concentrated hydrochloric acid. The serving wires thus prepared were soldered over with commercial soldering tin, by means of a copper bolt. The space between the serving wires and the cable was completely fiilled with tin. No solder, however, was applied between each two of the served sections. The finished terminal is seen in Fig. 1,c.) For practical use, the free end of the cable as far as it is to be covered by the last section of the wrapping wires should be cut at a bevel to produce a cleaner terminal. This, however, is only a matter of good appearance and has, therefore, been neglected for these, purely experimental, purposes. The described method of making soldered cable terminals differs in some regards from what is usual in the United States. The application of stearic acid and rosin, for instance, as it is recommended in America as solder flux instead of zinc chloride, was also tried in a number of preliminary experiments, but did not quite provide the same adhesive strength of the terminal.

COMPARED to the splice, which is still almost exclusively used by German aircraft manufacturers, the soldered terminal possesses three very remarkable advantages. Firstly, it is easily made by any reliable man, while splicing requires a great amount of skill and experience. Secondly, a soldered terminal is finished in considerably less time than a splice and, therefore, cheaper. Thirdly, in a soldered terminal all wires of the cable remain untouched in their normal position and there is, therefore, no weak point at the end of the terminal, as described above for splices. In fact, all cables with soldered terminals, when tested, broke in the middle of the sample, under the full breaking load of the cable. So, the soldered terminal is an end connection of 100% efficiency.

Fig. 3. Corroded Splices after the Tensile Test. (a): series 8, sample No. 1. (b): series 8, sample No. 2. (c): series 31, sample No. 2.

COMPARED to the sleeve fitting, there are also advantages in favor of the soldered terminal. While the sleeve fitting requires a special draw bench and proper wire dies for each size, a copper bit as at hand in every work shop and tool box is the only tool necessary for making soldered terminals. And furthermore, a soldered terminal may be applied with equally good results for bare or coated cable without difference in strength. Finally, defects which may eventually occur in service are, on inspection, more easily detected in the soldered terminal.

The sleeve fitting, however, is the best looking end connection of all three although, in most cases, a little heavier than the other two. As regards size and weight, an advantage may possibly be seen for the splice, in Fig. 1. But as, to remain on the safe side, one must necessarily reckon with a loss in strength due to splicing of 25%, a heavier cable must be chosen to make up for those two unavoidable weak points at the ends of splices. So, the high efficiency in strength of the soldered terminal and of the sleeve fitting accounts for the fact that, provided equal breaking loads, straining cables are heavier when spliced than with the two other types of end connections, as soon as their total length is somewhat upward of about five feet.

AN objection frequently made against soldered terminals is that the remainders of the hydrochloric acid which has been used in the soldering fluid may favour corrosion. The decision about this was left to the experiments. But, to provide for alternative results from the beginning, some of the soldered terminals were dipped in soda solution for 24 hours prior to being exposed to the corrosion attack. The soda solution was expected to neutralize all particles of acid which would have been left on the terminal. The soldering fluid may also be freed from acid by just adding a sufficient quantity of ammonia.

Results of Tensile Tests On New and Corroded Samples

Testing Machines: 2 ts Amsler and 20 ts Mohr & Federhaff

Table 3

Series of Samples No.	Wire in Cable	End-Connection	Additional Corrosion Preventive	Attack of Spray Fog	Breaking Loads of Sample No. 1	2	3	Average	Loss in Strength Due to Corrosion Attack
				Days	Lbs.	Lbs.	Lbs.	Lbs.	%
1	Zinc Coated	Sleeve Fittings	None	0	4500	4480	4500	4490	—
2			None	120	3960	3790	3840	3860	14.0
3			Linseed Oil	120	3890	3760	3740	3800	15.4
4			Alum. Bronze	120	4170	4160	4310	4210	6.2
5			Bituminous	120	3550	3560	3500	3540	21.1
6		Splices	None	0	4280	3970	3900	4050	—
7			None	120	3630	3680	3040	3450	14.8
8			Linseed Oil	120	2720	3210	2180	2700	33.4
9			Alum. Bronze	120	4150	4190	4170	4170	0
10			Bituminous	120	3420	3210	3270	3300	18.5
11		Soldered Terminals	None	0	4500	4460	4480	4480	—
12			None	120	4140	4020	4010	4060	9.4
13			Linseed Oil	120	3350	3960	3850	3720	17.0
14			Alum. Bronze	120	4370	4370	4370	4370	2.5
15			Bituminous	120	3460	3480	3560	3500	21.9
16		Soldered & Dipped in Soda Solution	None	120	3880	3950	3840	3900	12.9
17			Linseed Oil	120	3330	3720	3580	3540	21.0
18			Alum. Bronze	120	4290	4270	4280	4280	4.5
19			Bituminous	120	3620	3780	3450	3620	19.2
20	Cadmium Coated	Sleeve Fittings	None	0	4150	4200	4020	4120	—
21			None	120	4120	4090	4070	4090	—
22		Splices	None	0	3970	4170	4100	4080	—
23			None	120	4500	3820	3400	3910	4.2
24		Soldered Terminals	None	0	4720	4770	4780	4760	—
25			None	120	4680	4700	4400	4590	3.6
26		Soldered and Dipped in Soda Solution	None	[1]	4630	4560	4650	4610	3.2
27			None	60/120 [2]	4740	4360	4510	4440	6.7
28	V 2 A Steel	Sleeve Fittings	None	0	3750	3730	—	3740	—
29			None	120	3550	3840	3560	3650	—
30		Splices	None	0	3700	3370	3440	3500	—
31			None	120	3380	3330	3340	3350	4.3
32		Soldered Terminals	None	0	3990	4030	4040	4020	—
33			None	120	3650	3410	3460	3510	12.7
34		Soldered & Dipped in Soda Solution	None	[1]	3480	4400	3810	3900	3.0
35			None	120	3820	3870	3890	3860	4.0

[1]) The samples of the series 26 and 34 had not been exposed to the salt water spray fog, but just left in a rather dry room of about 20 deg. Cent. during those four months.
[2]) Sample No. 1 of series 27 had been exposed to the spray fog for 60 days only.

3. Additional Corrosion Protection

METALLIC coats of zinc or cadmium are not considered sufficient corrosion preventives. In service, aircraft bracing cables are, therefore, either soaked in oil prior to assembly or given a coat of paint after being tautened in place. In order to take into consideration the influence of such additional means of corrosion protection, various samples of the zinc coated cable were subjected to one of the following treatments:

a) soaked in boiling linseed oil for eight hours;

b) degreased and given two coats of aluminum bronze paint, brand "Cyclop Aluminum";

c) degreased and given two coats of black bituminous paint, brand "Inertol 49".

Each of these treatments was applied to samples with the different end connections. For comparison, various samples were left without additional protection. All details are given, with the test results, in Table 3.

+ + +

4. Exposure to Corrosion Attack

THREE samples with each of the mentioned end connections were subjected to a tensile test right away to find the initial breaking loads. All other samples were at first completely dried and then placed vertically in a glass locker which is provided with a number of spray nozzles in the bottom. A 20 per cent. solution of sodium chloride was sprayed through the nozzles once an hour for ten minutes by a compressor which is automatically switched on and off by means of a clockwork device. The spray fog was very dense and did not fully settle in the fifty minutes between two successive sprays so that the samples were kept damp for the whole duration of the test. This exposure was continued for exactly four months without interruption. The samples were then taken out and tested for their breaking load. All test results will be found in Table 3.

5. Appearance of Samples After the Corrosion Attack and How They Fractured in theTensile Test

+ + +

A. Zinc Coated Cables Without Additional Corrosion Preventive

(series 2, 7, 12, 16):

THE particles of salt and rust adhering to the samples could be wiped off easily with a rag which had been soaked in kerosene oil. Thus cleaned the outer wires of the cable presented a uniform black surface while the inner wires had turned bluish green. All wires had evidently been slightly attacked by the rust. While in the new samples when tested all wires had broken through instantaneously at the same point of the cable, the wires of the corroded samples fractured one after the other, and the points of failure were distributed irregularly over the whole length of the sample. This proves that various wires had been weakened locally by the corrosion attack. Even the spliced samples fractured in the same way, while when new, as mentioned above, they always break at the end of one of the two splices. The losses in strength as produced by the four months of salt water spray test were from 9 to 15 per cent.

+ + +

B. Zinc Coated Cables Soaked in Boiling Linseed Oil

(Series 3, 8, 13, 17):

WHEN salt and rust had been removed, all wires, outer and inner ones, showed, in general, again the original lustre of the zinc coat, but were badly attacked by the rust in some places. In the tensile test, they proved to have suffered much greater losses in tensile strength than the samples without additional corrosion preventive. The fractures of the wires occurred again at different points well distributed over the whole length in those samples that were provided with sleeve fittings or soldered terminals. The spliced samples had been corroded particularly badly near the thimbles; they all fractured at the pointed end of one of the two thimbles, a and b, in fig. 3. Why the samples which had been soaked in linseed oil should have been attacked by corrosion worse than the samples without any rust preventive in addition to the zinc coat, is not yet understood. It does not seem possible that this just happened incidentally, as the test results obtained on 12 samples agree with each other in this regard. But the linseed oil may possibly have contained some dangerous reagent as impurity. In any case, until this can be fully explained by further experimental data, soaking zinc coated cables in linseed oil must be considered as a quite unsatisfactory means of additional rust protection.

+ + +

C. Zinc Coated Cables With Two Coats of Aluminum Bronze Paint

(Series 4, 9, 14, 18):

THE coat of paint was still tight, elastic, and well adhering to the wires. After the paint had been removed from the samples, no indication of a corrosion attack could be detected on either outer or inner wires. In the tensile test, the samples with soldered terminals fractured instantaneously in the middle, and the spliced samples at the end of one of the two splices —which are the same types of fractures that normally occur in the respective new samples. Only in the samples with sleeve fittings, a few wires broke prematurely at different points. All aluminum bronze painted samples had suffered smaller losses in tensile strength than any other of the zinc coated samples. So, aluminum bronze paint can be regarded as a very efficient means of additional rust protection for zinc coated steel wire cables, and it does practically not matter which one of the three above mentioned types of end connections is used.

D. Zinc Coated Cables With Two Coats of Bituminous Paint

(Series 5, 10, 15, 19):

THE paint still adhered well and was undamaged and sufficiently elastic, but small deposits of corrosive products were found underneath, evenly distributed over the surface of all wires. Both this observation and the tensile test results prove that the bituminous coat is by far inferior to the one of aluminum bronze paint.

✦ ✦ ✦

E. Cadmuim Coated Cables

(Series 21, 23, 25, 27):

UNDER the rust and salt, the cadmium coat originally shining greyish white had turned uniformly black. Local rust deposits were not visible. Regarding the reduction of tensile strength, the cadmium coated cables proved to be considerably much better than the zinc coated ones and hardly inferior to those zinc coated cables which were further protected by aluminum bronze paint. If cadmium coated cables had been given the same additional rust protection, their breaking load would probably not have been reduced at all, under the conditions of the corrosion attack as applied here. The results were equally good for all three types of end connections.

✦ ✦ ✦

F. V 2 A Steel Wire Cables

(Series 29, 31, 33, 35):

BEING properly cleaned the samples looked like new. Generally, only very slight losses in tensile strength were found. However, the samples with soldered terminals had suffered somewhat greater reductions of their breaking loads, which is quite in accordance with former test results obtained in the Fried. Krupp research laboratories. V 2 A steel is attacked by concentrated hydrochloric acid. By dipping the soldered terminals in soda solution for 24 hours, better average values were obtained (series 34 and 35), but the test results plot rather irregularly which seems to be somewhat alarming. In fact, long before the final breaking loads were reached in the tensile test, various wires of these samples broke, as well (visible) outer wires as (audible) inner ones. Only sample No. 2 of series 34 failed instantaneously at a quite abnormally high breaking load. Apart from this exception, the fractures of wires were already observed at loads as low as ⅓ of the final breaking load of the particular sample, which indicates the existence in those wires of weak points that can only be traced back to the chemical action of the concentrated acid. For V 2 A cables, therefore, the application of hydrochloric acid seems to be dangerous and should be avoided by all means.

✦ ✦ ✦

6. Summary and Conclusions

a) TYPES OF WIRE: Four months of exposure to a salt water spray fog attacked the cadmium coated cables less than the zinc coated ones. The V 2 A steel cables are, in general, very resistant to corrosion, but do not prove satisfactory when attacked by concentrated hydrochloric acid such as is used for making soldered terminals.

b) END CONNECTIONS: Sleeve fittings are end connections of 100% strength on zinc coated cables. The bare V 2 A wires seem to be too hard for this purpose and should be galvanized at the ends prior to applying sleeve fittings. Electrochemically cadmium coated wires are too soft to hold the sleeves. They should be either cadmium coated by the hot process or freed from the cadmium coat and subsequently galvanized. The anti-corrosive resistance of the sleeve fittings is very high.

SPLICES are always weak points in a bracing cable. With unsatisfactory additional protection, they are particularly liable to corrode (series 8). But sometimes, splices have a much higher breaking load than expected (sample No. 2 of series 23). For this uncertainty and fror the skill and experience required for making them, splices are inferior to the other types of end connections examined.

IN SOLDERED TERMINALS, the full breaking load of the cable can always be obtained for any type of wire. Such terminals are easily made and cheap. Their application is dangerous only for bare, especially V 2 A, steel wire cables, as these are very likely to corrode under the reaction of the hydrochloric acid which is used prior to soldering. The zinc and cadmium coated cables have not been weakened by the acid; subsequent washing in soda solution is not necessary, it even seems to promote corrosion to some extent.

✦ ✦ ✦

C. Additional Corrosion Preventives

A double coat of aluminum bronze paint reduced the effect of corrosion considerably and is by far superior to bituminous paint or soaking in linseed oil. On cadmium coated wires, the aluminum paint has not been examined, but it is not probable that any difficulty would arise in that case, so that it may be taken for granted that the aluminum paint will behave just as good on cadmium as on zinc coated wires.

✦ ✦ ✦

ACCORDING to these test results, the most favourable combination would be a cadmium coated cable with soldered terminals or—provided the above mentioned precautions are strictly complied with—sleeve fittings, and subsequently given two coats of aluminum bronze paint. V 2 A steel wire cables should not be soldered. When provided with sleeve fittings—previously galvanized underneath—V 2 A steel cables would render unnecessary the application of any additional corrosion preventive.

The results as summarized above are naturally subject to the test conditions which have been adopted in this investigation. But those conditions have been carefully chosen so to consider as far as possible rough service conditions of seaplanes. A generalization of the test results appears, therefore, to be permitted to a certain extent.

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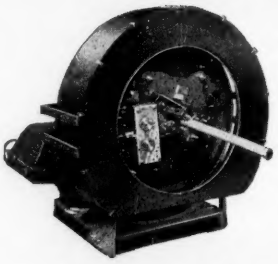
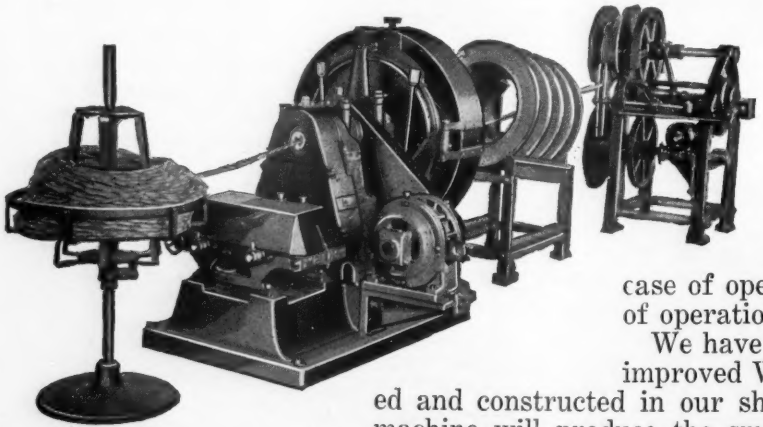


Above is shown a sample of this latter armor while at the right is the head which lays the protective covering over the core. These heads are made in two sizes, handling cables 5/16 inches to 3 inches in diameter. They lay on from 100 to 300 turns of strip per minute, depending on the cable diameter, and are equally capable of producing all types of Hollow Flexible Conduit.



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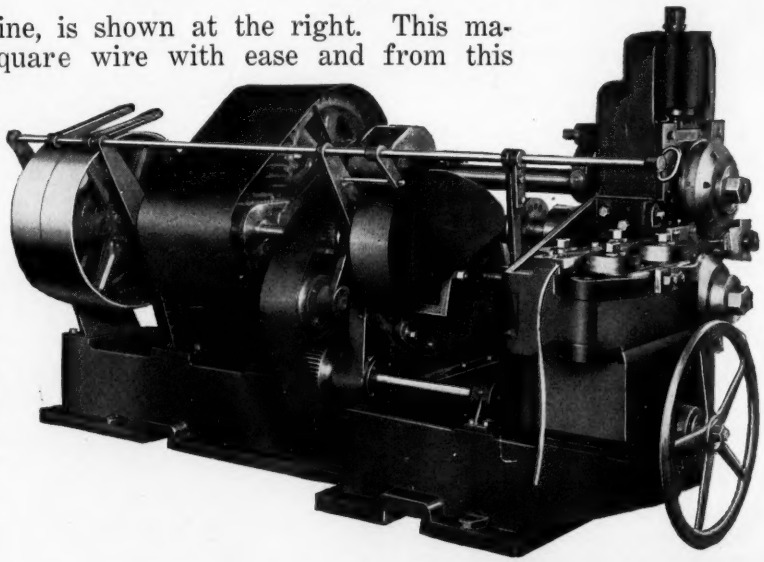

This is not an exhibition performance but regular mill production and can be maintained over a long period.

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Automatic Combustion Control Systems for Wire Furnaces

By F. Aschner and H. Mayer-Witten*

Part I--Sec. I

Automatic furnace control is of special significance in the manufacture of wire, since the economy of the process and the quality of the production largely depends upon the management of the furnaces and ovens.

The present articles deal with the regulating systems developed in Germany; Part I, covering the types of regulators used and Part II, showing the methods of operation and the results of service in existing installations.

Endeavours towards rendering the firing regulation automatic are of special significance in the manufacture of wire, since the economy of the process and the quality of the production largely depend upon the management of the ovens. The present articles deal (Part 1) with the problems of oven regulation in the wire industry; and (Part 2) some regulating systems developed and used in Germany and the methods of operation as well as the results of service in existing installations.

Problems of Regulation and Construction of the Regulators

WITH the increasing technical completion of industrial plants, the demand for automatic combustion control, not only for steam raising installations, but also for industrial furnaces, because more and more urgent. Only automatic regulators for the operation of oven auxiliaries ensure that the plant will be continuously used at the highest possible efficiency. In this way, the furnaces can be regarded as machines wherein the regulators are of as great importance as speed regulators, pressure regulators etc., for any other power generator or utiliser.

Whereas automatic equipment for charging and discharging has already been introduced to such a degree that it is incorporated in almost every modern installation, the development of technical regulation for combustion and heating is still actively progressing. In the manufacture of wire, automatic service assumes particular importance as the advantages are apparent not only in the improved efficiency for the ovens, but above all, the quality of the finished product is improved and maintained constant.

*) Engineers of the Combustion Engineering Department of the Allgemeine Elektricitäts-Gesellschaft, Berlin.

THE prototypes for the regulating principle for industrial ovens, as employed for the manufacture of wire, are automatic combustion control systems which have been extensively developed for and applied to boiler installations where the use of the regulation has been accompanied with excellent results.

The most important of the regulating problems to be solved is the control of the heat supplied; therefore, depending upon the particular construction of the stove, the gas, oil, electric current or coal supplied has to be regulated. The criterion for the quantity of heat to be delivered is the furnace charge temperature which, however, can seldom be satisfactorily determined. In most instances, therefore, the stove temperature is measured, as this can be regarded as a sufficiently accurate measure for the heat supply required. The apparatus used for setting up and transmitting the impulses must be sensitive to changes of temperature, and the choice of the apparatus type depends on the temperature range to be regulated and on the construction of the stove. The following section deals with the construction of the individual apparatus and the methods by which the temperature impulses are transmitted.

In addition to the control of the fuel supply, the accurate regulation of the volume of combustion air is also of decisive importance as it constitutes the essential feature for obtaining favourable combustion continuously. The general method for determining the volume of air is based on measuring the pressure drop of the current of air in the air lines, or if no special air line is provided, the volume is checked by determining the

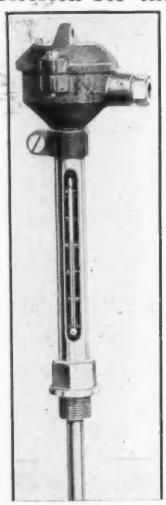


Fig. 1.

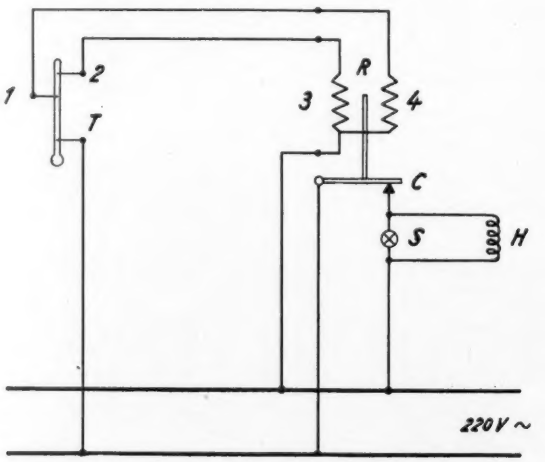


Fig. 2.

Contact and resistance thermometers used for temperatures up to 350°C. (640°F.)

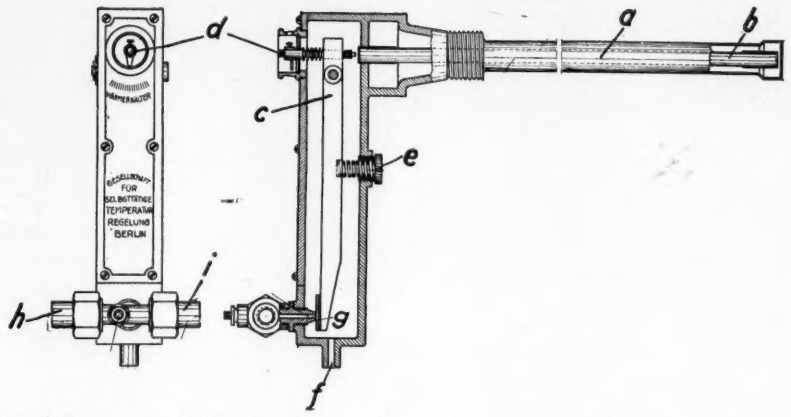


Fig. 4. Example of a tension thermostat.

difference in pressure in the flues. The air volume can be varied by way of dampers and gate valves in the incoming or outgoing pipe lines, or it may be changed by altering the speed of blowers.

In special cases, and particularly with large stoves running on the regenerative or recuperative processes, it is required that the pressure inside the stove be maintained constant. Control is suitably effected by way of the flue gas damper. Special stress is to be placed on the careful construction of this device to ensure easy operation and pertinent dimensions.

The automatic change-over of the air pre-heaters has been the object of a recently developed regulating method for regenerative stoves. No special obstacles are encountered in the transition to automatic control for the change-over, as mechanical-hydraulic equipment which is already extensively used, and by which changing-over is rendered possible by a few handgrips, has prepared the way for fully automatic service.

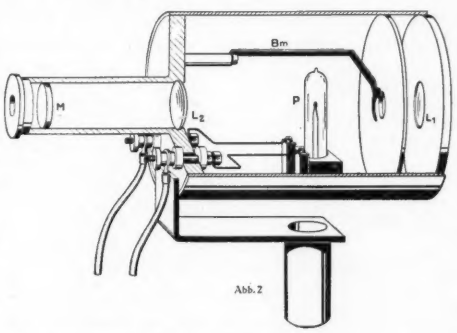


Fig. 6A. The A E G Askania process.

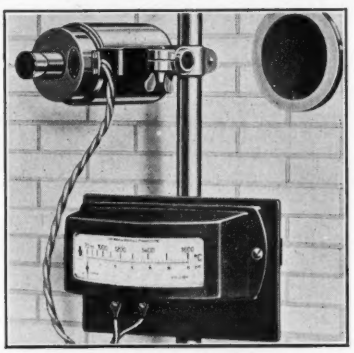


Fig. 6B.

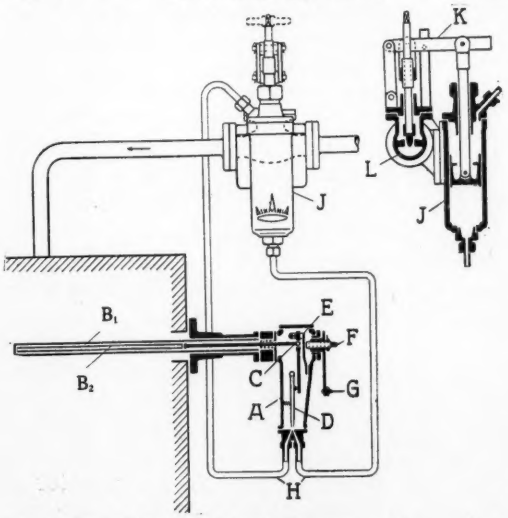


Fig. 7. Method Used In Askania Process.

Construction of Regulators

THE construction of the regulating accessories which control the heat supply is decisively influenced by the temperature of the stove. Contact thermometers, resistance thermometers, metal thermostats, thermocouples and optical pyrometers are used for imparting the impulses to the control mechanism of the regulator.

Contact and resistance thermometers are generally used for temperatures up to 350° C (650° F); the first-mentioned kind of thermometer utilise the mercury column of the thermometer to close the electric circuit when a predetermined temperature is attained. (See Fig. 1 and Fig. 2.) When the temperature falls below the value for which the contact is fitted, the current is again interrupted. Sometimes, various contacts are fused over a definite range of the capillary tube so that adjustment of the nominal value is possible.

With the resistance thermometers the characteristic of metal wires to change the electrical resistance with the temperature, is used to effect the deflection of a sensitive moving coil instrument which originates the regulating impulse. (See Fig. 3.)

With metal thermostats, the change in length of a metallic tube or rod is used for starting regulating impulses at variable temperatures. Suitable link mechanisms are built in between the thermostat and the actual regulating relay. Recently, the range of application for metal thermostats has been extended up to 1050° C. (1900° F) by reason of improved construction and high quality materials. One of the most frequent types comprises a tube with a high temperature coefficient of expansion and a rod with a low temperature coefficient. The rod which is mounted inside the tube, is fixed to the outside end of the tube. The relative motion of free end of the rod actuates the relay. Instead of these tension thermostats, use is occasionally made of pressure thermostats in which the tube and the rod are retained in mechanical contact by the pressure of a spring. Fig. 4 depicts an example of a tension thermostat.

THE highest temperatures encountered in the manufacture

of wire, such as the temperatures of the ingots and bars for the raw material of the rolls, are indicated by thermo-couples and optical radiation pyrometers. (Ardometers). With the thermo-couples the difference of potential at the soldered joint of the two metals having different specific conductivities is utilized to influence the regulating relay by way of the thermo-current generated. The soldered joint is protected by a metal tube which is exposed to the temperature to be measured.

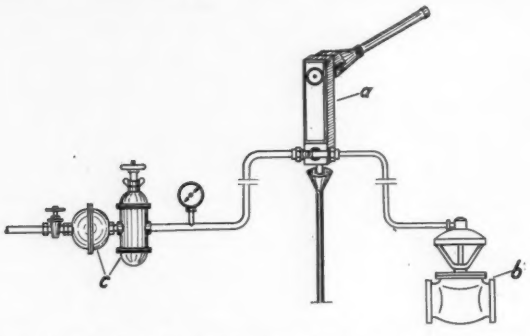
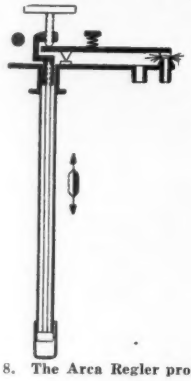


Fig. 9. The Gesellschaft für selbsttatige Temperaturregelung (GST) process.



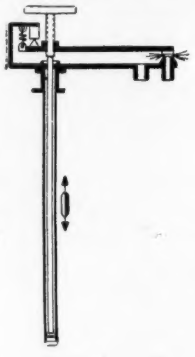


Fig. 8. The Arca Regler process.

It is impossible to provide the soldered joint at the place of measurement, optical pyrometers, such as shown in Figs. 6a and 6b are used. The radiant heat from the material in the (Fig. 6a and 6b) furnace is concentrated on to a small blackened platinium plate P by way of a convex lens L1; this platinium plate carries the soldered joint of the thermo-couple. A second lens L2 throws an image on to the frosted disc M, thus enabling the pyrometer to be adjusted accurately on to the hot body. Fig. 6b shows the exterior of an ardometer of this kind.

All of the apparatus sensitive to temperature changes which have been described up to the present, naturally require special devices for transmitting the impulse received to the actuating equipment itself. These devices may operate mechanically, hydraulically, pneumatically or electrically.

The Askania Process

FIG. 7 shows the method used in the AEG Askania process for the temperature range of the thermostats. The element of the regulator is constituted by the jet pipe which is diverted from its normal position by the change in length of the thermostat. Any chosen pressure medium flows through the jet pipe, oil being frequently used. A distributor directs the oil to one side or the other of the adjusting member controlling the power cylinder according to the position of the jet pipe. The desired operating temperature is adjusted by way of the screw F which transmits the variation to the jet pipe system by means of a counter-spring E.

If the plant to be regulated has a large capacity for heat, as is specially a characteristic of technical stoves, an alteration of the heat supply only affects the temperature at the place where regulation is carried out after some time; for this reason, a special resetting device is necessary. The resetting lever G is connected to the adjusting device by a wire cable so that a definite movement of the piston imparts a resetting impulse to the adjusting screw F. In this way, there exists a step regulation which prevents the control piston, and its coupled device for adjusting the heat supply, from travelling into the limit position after the jet pipe has been deflected. Subsequent control only takes place when the temperature varies from the nominal value, i. e., if the movement of the adjusting device has not already effected the necessary alteration. The irregularity of the regulator established by this resetting device is generally within the desired degree of accuracy.

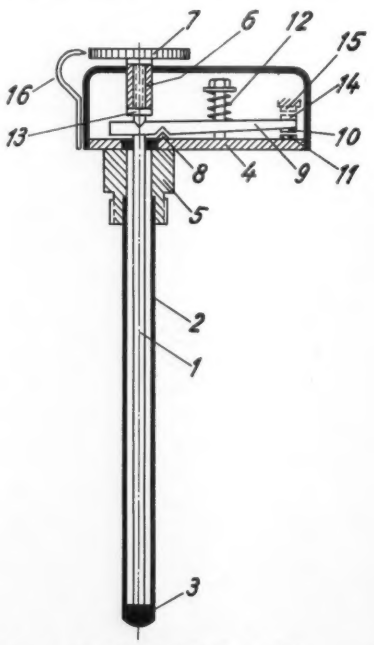


Fig. 10. The Kieback & Peter regulator.

FIGS. 8 and 9 depict two systems as used by the Arca Regler Co. and the Gesellschaft für selbsttätige Temperaturregelung (GST) respectively; both systems are very similar as regards the transmission to the adjusting device, either hydraulic or pneumatic means being employed. A sensitive rod controlled from the thermostat is common to both systems; this rod determines the pressure of the fluid acting on the adjusting device.

With the G S T regulator (compare also fig. 4), the control medium operates directly on a diaphragm valve, but with the Arca regulator, as also with the Askania regulator, a liquid servo-motor is

(*Please turn to page 311*)

Outstanding Personalities of the Wire Industry

JOHN K. BRODERICK

JOHN K. Broderick, President of the Broderick & Bascom Rope Co., since 1919 has had a most interesting career. He was educated at St. Louis University graduating with a degree A. B. in 1896. Georgetown University, degree A. M. 1897. St. Louis University, degree 1899 with an additional education at the University of Berlin, Strassburg, and Vienna, — also Paris, London and Kiel, 1900-1901-1902.

Decided to discontinue his medical activities which had been principally along research lines, he became identified with Broderick & Bascom Rope Company, in 1925, as salesman, and became sales manager in 1909. Following the death of John J. Broderick in 1919, Founder and President, of the company, he became President in 1920.

Activities while with the Broderick & Bascom Co., have been along the lines of sales development in conjunction with production and research, and also improving and developing material and manufacturing methods.

During his business career he has been intimately connected with civic movements and Chamber of Commerce activities, particularly the Sales Managers Bureau, of which he was President for three consecutive terms, 1915-17.

J. S. Tritle was recently elected Vice-President and General Manager in charge of the manufacturing, sales and engineering operations of the Westinghouse Electric and Mfg. Co. Mr. Tritle was born in 1872. Graduated from Yale in 1893 and in 1895 entered the electrical engineering contracting business in which he continued for eight years. He was chief of construction for the Worlds Fair at St. Louis and at the close of the Fair became manager of the Kansas City district for the Westinghouse Company. Since that time he has been connected with the Westinghouse Company on various activities. In his new position his headquarters will be at East Pittsburgh, Pa.

✦ ✦ ✦

Robert McMillan, purchasing agent of the Pittsburgh Steel Company and its various subsidiaries, called divisions, retired July 1st.

Mr. McMillan became assistant purchasing agent of the H. C. Frick Coke Company, in 1886, holding the position for ten years. After spending a short time outside the iron and steel ranks he became Pittsburgh district purchasing agent of the American Steel & Wire Company, holding the position for 11 years, whereupon June 10, 1910, he became purchasing agent of the Pittsburgh Steel Company. Thus he retires after 21 years of service in the company and 45 years of activity as a buyer.

✦ ✦ ✦

C. L. Ferguson has resigned as general superintendent of the Falcon plant at Niles of the Empire Steel Corporation, Mansfield, to assume a similar post with the Mahoning Valley Steel Company, also of Niles. He succeeds **Harry Davis,** resigned effective May 31st. **David Smith,** hot mill superintendent of the Falcon works, will serve as director of operations for the Falcon units.

✦ ✦ ✦

George F. Newell has been elected Vice-President and General Manager of the Pyrometer Service and Supply Corporation, located at 1988 East 66th Street, Cleveland, Ohio, which is a subsidiary of the Claud S. Gordon Company of Chicago, pyrometer and industrial X-ray engineers.

✦ ✦ ✦

Howard J. Mehl, traffic manager of the Diamond Chain & Mfg. Co., Indianapolis, died at the age of 43 years. He was born in St. Louis and had been with the Diamond Chain company for 25 years.

A. L. Adams of the J. H. Whittemore Company of Naugatuck was added to the directorate of the Scovill Manufacturing Company at their most recent directors' meeting held on April 20. The executive officers of the company are president and general manager, Edward O. Goss; vice president and general superintendent, John H. Goss; vice president and superintendent of mill departments, Chauncey P. Goss, Jr.; vice president, P. A. Goss; treasurer and comptroller, L. P. Sperry; assistant treasurer, F. J. Gorse; secretary, William M. Goss; assistant secretaries, B. P. Hyde and T. P. Myers.

✦ ✦ ✦

E. L. Hartpence, vice president of the Acme Wire Company, New Haven, presented his resignation at the last meeting of the board of directors. The reason for his withdrawal is said to be on account of ill health. He still continues as a director of the company.

✦ ✦ ✦

J. W. Bersheid, of Joliet, Ill., has been appointed superintendent of Fairfield, Ala., works of American Steel & Wire Co., Cleveland. He succeeds **Thomas D. Temple,** who filled that position for 15 years and who has been transferred to Joliet to take charge of the corporation's two plants there.

'Round the World With the Wire Industry

German Wire Exports Increase

ON the wire export market the situation has improved. The demand for wire is decidedly better and especially from the Far East, India, South Africa and the Argentine Republic where more orders have been placed. This is the reason, why the continental wire rod cartel has not further reduced the production allotment for the second quarter of this year, but left everything unaltered. The prices however are further down. This is due to the circumstance that the Belgian industry is divided in 3 groups, which are eagerly competing and fighting for every order, so that the prices have been heavily affected. On the export market it is further of importance that the freight rates for the Far East and the La Plata markets were reduced so that for example wire rids are now selling in Japan at $29.—per ton cif freely. The f. o. b. prices end of the month were as follows: wire nails £4.16.0 basis (which is s 4/ below the wire rod price), bright wire £4.17.6, galvanized wire £6.2.6, annealed wire £5.7.6, varnished wire £6.0, barbed wire BWG 12 £8.12.6. wire strand 7 ply ¼" £8.10 per ton. It is very probable, that even this unprecedented slump of the prices is not yet the end, but that prices will go further down. German prices are 2 -4s higher.

✦ ✦ ✦

Wood Screw Prices Lower

THE British/German wood screw entente is unable to upkeep the quotations in face of the growing Swedish and Czechoslovakian competition. The prices have been now reduced and are fluctuating between 82 and 83% discount off the British Standard list for wooden and 68-69% off the list for brass wood screws. Business is very dull on most markets.

✦ ✦ ✦

German Rope and Strand Wire Cartels Merge

THE German wire rope and the strand wire cartel have been merged. Both cartels will establish a joint buying office for raw material and sell all products, also for export through this office. The strand wire cartel has few outsiders, but the wire rope cartel has more and finds it difficult to compete in certain districts.

✦ ✦ ✦

Italian Mills Compete for Brass Wire Business

THE Italian industry is now a very keen competitor in brass. Italy has advanced her exports of brass wires very sharply from 10—15 monthly in 1928 to 90- 120 tons in 1930 and this year and is cutting prices. The Italian quality is said to be satisfactory and is selling now at the basis price of £62.-10 p.t. f.o.b. Italian brass wire is now pouring also in the U.S.A. market (Pacific Coast), but is chiefly sold in India, the Far East and Egypt.

✦ ✦ ✦

Japanese Mills Buying German Machinery

JAPANESE wire manufacturers have sent further inquiries to German machinery manufacturers concerning supply of wire machinery and wire mill equipment for Japanese works. Most probably very soon an order for further wire rod production will be placed and a number of orders for wire nail machinery are pending. It is probable, that the Japanese industry will use the production surplus for fostering further the export Trade. Last month also a few wire mesh and wire netting machines were purchased by Japanese mills. A Japanese Company has also purchased in Germany machinery from a bankrupt works, which produced mining mesh.

✦ ✦ ✦

Wire Sales Bureau For Belgium

IT is announced from Antwerp that, in the Belgian wire and nail industry, negotiations are well on the way to a renewal of the understanding between producers and the domestic market. The establishment of a sales bureau for Belgian wire products has been decided upon.

✦ ✦ ✦

British Standardize Wire-Cloth Test Sieves

THE British Engineering Standards Association has just issued the standard British specification for test sieves. It has been considered advisable to divide the standard sieves into three series: (1) fine-mesh sieves made of woven wire cloth, with a size of aperture ranging from .0021 in. (300 mesh) to .1320 in. (five mesh); (2) medium-mesh sieves made from woven wire cloth, with a size of aperture ranging from 1/32 in. to ½ in.; and (3) coarse-mesh sieves made from perforated metal plate, with a size of aperture ranging from ½ in. to 2 in. The series has a screening area varying from 35 to 44 per cent. In order to simplify manufacture and thus reduce the cost of production, the committee has considered it necessary to adopt mesh commonly used, and to specify sizes of wire included in the standard wire gauge sizes which are in common use. These restrictions have necessarily limited the choice of aperture dimensions and rendered the progression of the series of fine-mesh sieves slightly less uniform than could have been secured if odd counts and wire sizes had been adopted.

The many uses to which test sieves are put are so varied that the committee of the association is unable to specify the material from which they are to be made. For ordinary purposes, however, it is recommended that steel should be used for sizes coarser than 40 mesh and phosphor bronze for the finer meshes.

✦ ✦ ✦

British Cable Firm Introduces New Products

SEVERAL introductions of interest have recently been announced by **British Insulated Cables Ltd., Prescot.** The firm has recently increased its range of ex-

(*Please turn to page 304*)

A Review of Recent Wire Patents

Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 551 Fifth Avenue, New York.

No. 1,803,691, PROCESS AND APPARATUS FOR PLATING WIRE, Patented May 5, 1931, by Carl P. Brockway, of Ridgewood, New Jersey, Assignor to World Bestos Corporation, of Paterson, New Jersey, a Corporation of Delaware. Particularly, this invention covers the chromium plating of iron wire to be used in a ballast tube for automatically regulating the current flowing through certain electrical circuits, altho the process may be used for plating for other purposes. The process includes subjecting the wire to a relatively low current of electricity in a plating bath and gradually permitting the current to increase until a concentrated plating action takes place, whereby the plate is applied to the wire in sectional areas varying in density.

✦ ✦ ✦

No. 1,803,803, PROCESS OF MAKING SCREWS AND BOLTS, Patented May 5, 1931, by Chas. Kaufman, of Garfield Heights, Ohio. The inventor describes this an improvement over the process described in his prior U. S. Patent No. 1,617,122, dated February 8, 1927, and the present process includes drawing a portion of a length of stock of cross-sectional area greater than that of the shank of the blank to form a round cross section of a diameter equal to the overall diameter of the threads of the finished article, drawing down a portion of the round cross section to a diameter equal to the pitch diameter of the threads, and upsetting the unreduced portion of the stock to form a head.

✦ ✦ ✦

No. 1,804,076, WIRE FOR WINDING MOTORS, ETC., Patented May 5, 1931, by Armais Arutunoff, of Bartlesville, Oklahoma. This inventor employs a single wire, of large diameter, but with considerable flexibility, produced by taking a wire comprising a longitudinal core, with a body portion surrounding the core and integral therewith, the body being provided with a series of longitudinally extending, substantially closed slits, radiating from the boundries of the core and tangential thereto.

✦ ✦ ✦

No. 1,804,486, APPARATUS FOR TREATING WIRES, Patented May 12, 1931, by Parvin Wright, of Seattle, Washington. The apparatus is especially adapted for processes for annealing, tempering, galvanizing and electro-plating wire, an object of the invention being to provide means for exposing the longest length of wire in the most confined space to the action of heat, to the action of the bath desired, and to the action of the electric currents, and the like.

✦ ✦ ✦

No. 1,804,459, SCREW CUTTING DIE, Patented May 12, 1931, by Ernest T. Bysshe and Robert R. Finn, of Springfield, Vermont, Assignors to Jones & Lamson Machine Company, of Springfield, Vermont, a Corporation of Vermont. Objects of the invention are to provide a die for use in stationary or rotating dies, in which the locking member locks the die in its closed position and is engaged and held at points all around its circumference, and to provide the die with a floating support so as to have proper centering of the die when starting on the work.

✦ ✦ ✦

No. 1,804,705, METHOD OF MAKING COILED SPRINGS AND SPRING CASINGS, Patented May 12, 1931, by Charles Leigh Paulus, of Dayton, Ohio, and Herbert O. Russell, of Detroit, Michigan. This invention relates to winding coiled springs, etc., without the usual heat treatment to insure the coils being in actual contact with each other. The method consists in winding a wire or rod into a coil and simultaneously causing the convolutions of the coil to assume a closed contactual relation by imparting an axial twist to the wire or rod.

✦ ✦ ✦

No. 1,804,821, SPRING STRUCTURE, Patented May 12, 1931, by George A. Stackhouse, of Oakland, California, Assignor to L. A. Young Spring & Wire Corporation, of Detroit, Michigan. The unit comprises helically coiled wire body springs, the end coils of which are provided with alined loop-like offsets and which terminate in inwardly facing hooks, disposed opposite the loops and engaged with the end coils to constitute their ties, the springs being arranged in rows in alignment, flexible side members provided with pockets at their top and bottom edges, into which are placed helically coiled spring border members, the opposite outer rows of the body springs having their hooks disposed outwardly and clamped upon the enclosed border members, the other hooks being engaged with the enclosed cross tie members and the loops of adjacent rows.

✦ ✦ ✦

No. 1,804,888, PIPE COILED WITH STEEL WIRE FOR PRESSURE CONDUITS AND VESSELS UNDER PRESSURE, Patented May 12, 1931, by Simon Pierre Monsch, of Pontezer near Guingamp, France. This pressure tube comprises a cylindrical metal tube, with a number of continuous wires wound convolutely on the tube, the tension of the wound wire increasing with each successive wind.

✦ ✦ ✦

No. 1,804,911, CORE COVERING APPARATUS, Patented May 12, 1931, by John Leslie Alden, of LaGrange, Illinois, Assignor, by Mesne Assignments, to Western Electric Company, Incorporated, of New York, N. Y., a Corporation, of New York. The apparatus is designed to wind textile covering on wire or any windable insulating material onto wire.

✦ ✦ ✦

No. 1,804,996, WIRE SUPPORT AND GUIDE, Patented May 12, 1931, by Albert S. McDonald, of Quincy, Massachusetts, Assignor, by Mesne Assignments, to Bay State Fishing Company, of Boston, Massachusetts, a Corporation of Massachusetts. For the purpose of assisting in the unreeling of wire from a wire coil, this device is intended to guide the wire so that catching or snarling is avoided.

✦ ✦ ✦

No. 1,805,833, CLIP, Patented May 19, 1931, by Daniel McLeod, of Dallas, Texas. This is a binding clip, constructed of bent wire, used to hold sheets and like in place in a bidder.

✦ ✦ ✦

No. 1,806,697, COIL WINDING MACHINE, Patented May 26, 1931, by William O. Meissner, of Chicago, Illinois, Assignor to The Meissner Manufacturing Company, of Chicago, Illinois, a Corporation of Illinois. Particularly adapted for winding coils of relatively light insulated wire, such as is used in the construction of radio sets, the invention covers means for automatically feeding the insulating paper sheets into the coil by mechanism which rocks the feed table at the proper instant, being synchronized with the winding mechanism so that it functions at the right time.

✦ ✦ ✦

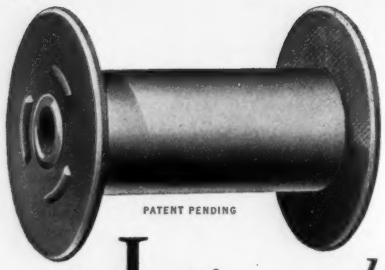
No. 1,807,364, DOWEL BAR SUPPORT, Patented May 26, 1931, by William E. White, of Chicago, Illinois, Assignor to Kalman Steel Company, of Chicago, Illinois, a Corporation of Delaware. This support is constructed of heavy wire, and is a division of the inventor's application for patent, bearing Serial No. 369,436, and which resulted in Patent No. 1,631,609.

✦ ✦ ✦

No. 1,789,898, WIRE STITCHER FEED, Patented March 31, 1931, by Joseph N. Pagliarul, of Milwaukee, Wisconsin. This invention relates to wire stitching machines in which the wire is fed intermittently to a staple-forming-and-driving mechanism, and the object of the invention is to provide a mechanism for varying the feed of the wire, to thus enable the machine to be readily adjusted for making and driving staples of different sizes to suit the thickness of the piece of work at hand.

✦ ✦ ✦

Mr. G. K. Rylands of Rylands Brothers, Ltd., Warrington, Lanc., England, takes issue with Mr. L. D. Whitehead of Whitehead Hill & Company, Ltd., and defends the hot galvanizing process at the same time criticizing in detail the electro-galvanizing methods advocated by Mr. Whitehead. This second paper of a discussion on hot galvanizing vs. electro-galvanizing will appear in the August issue of WIRE AND WIRE PRODUCTS.



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Standard or Adjustable Sizes

OUR new, improved fibre reels are made especially to supply the American manufacturer's needs—that is, with the ⅝ inch arbor opening, most commonly used in America, as well as with an arbor opening which can be adjusted to suit the individual wire manufacturer's requirements.

Economical, Non-Returnable

With these new improvements, we can now furnish reels for winding the lighter guage insulated wire and cable. These light weight fibre reels are non-returnable and economical. They cut your costs and enable you to provide better service and more convenience for your customers.

Write for Information

We will gladly furnish you full specifications of this reel, complete information regarding sizes now available, and samples to demonstrate our principle of construction. In asking for quotation, please submit sample or following information: Quantity desired, overall dimension of the flanges, inside measurement between flanges, outside diameter of drum, diameter of bore and guage of wire to be wound on the drum.

Cut your costs with this reel!

SEFTON
NATIONAL FIBRE CAN CO.
3285 Big Bend Boulevard
Maplewood, St. Louis, Mo.

Exports and Imports of Wire

Exports of iron and steel wire products in March and April, 1931
(In gross tons)

	April 1931	March 1931	April 1930
Wire rods	3,239	3,594	4,299
Hoops, bands and strips	3,148	3,778	3,824
Plain wire, iron or steel	1,482	1,101	3,341
Barbed wire and woven wire fencing	2,639	2,163	4,763
Woven wire screen cloth	84	433	102
Wire rope	279	272	468
Insulated wire and cable	33	25	44
Other wire and manufactures	434	401	650
Wire nails	810	670	666
Nails other than wire	312	324	510
Tacks	50	29	60
Bolts, nuts, rivets, except track	576	519	908
Total, these 12 classifications	13,086	13,309	19,635

Imports of iron and steel wire and wire products into the United States
(In gross tons)

Wire rod	655	455	1,019
Concrete Reinforcement and other bars	9,630	9,264	4,168
Barbed wire	499	502	443
Round iron and steel wire	265	195	487
Steel telegraph and telephone wire	1	9	....
Flat wire and strip steel	62	65	114
Wire rope and strand	209	247	311
Hoops and bands	1,921	1,841	2,394
Other wire	63	96	19
Nails, tacks and staples	508	676	322
Bolts, nuts, rivets and washers	46	167	58
Total, these 11 classifications	13,859	13,517	9,335

EXPORTS of iron and steel products from the United States in April showed no marked changes. The chief items exported in points of tonnage were scrap, black steel sheets, plain shapes, tin plate and boiler and other plate. The trade with South America increased from 8,569 tons in March to 14,710 tons in April.

April shipments to Canada included 13,106 tons of scrap, while the trade with Japan included 1,838 tons of scrap and 1,084 tons of wire rods. The exports to Mexico included 499 tons of barbed wire.

EXPORTS of iron and steel wood screws were more than twice as large as in March amounting to 332,818 gross valued at $40,665, while the trade in brass wood screws also more than doubled reaching a total for the month of 20,951 gross valued at $7,714.

IMPORTS for April continued the upward trend registered during the month of March and were 18.5 per cent greater than in that month. Concrete reinforcement bars showed the third largest gain with an increase of 995 tons. Imports from Germany included 1,323 tons of concrete reinforcement bars.

RECEIPTS of card clothing, 8,903 square feet, valued at $13,168, were more than twice as large as in March. The United Kingdom with a total of 8,266 square feet valued at $12,019 supplied the bulk of this trade, with France, Germany, and Belgium supplying much smaller quantities.

Imports of wire cloth and screening increased to 23,210 square feet, with Germany, France, Canada, and the Netherlands the chief sources of supply.

Receipts of fourdrinier and other paper-making wire rose to 279,534 square feet and included wire brought in from Germany, France, Austria, the United Kingdom, and Sweden.

RECEIPTS of wire fencing, galvanized before weaving, totaled 1,879,200 square feet and originated entirely in Germany and Belgium, while those of wire fencing galvanized after weaving amounted to 3,756,050 square feet and were received from Belgium, the Netherlands, and Germany.

(*Please turn to page 304*)

It "Rang the Bell" At Once

MICROMETER PRECISION MICRO-WELD TRADE MARK

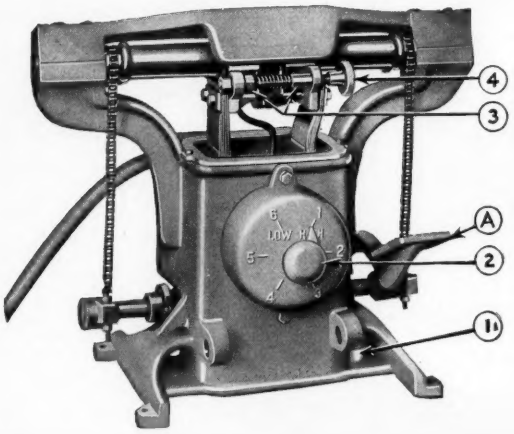
For Aluminum, Copper, Zinc

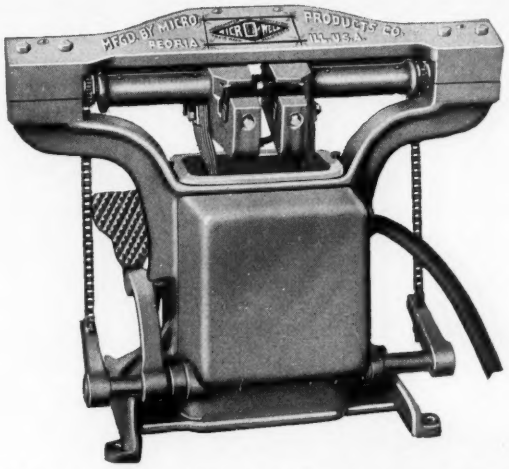
This model K for use on copper, aluminum, zinc and other metals that have always been difficult to weld has made a quick hit with workers of these metals.

Typical of MICRO-WELD products, it involves principles of construction that have been long sought by designers of welding machines—and, like other MICRO-WELDERS, it is a precision machine with all operations designed for minimum dependence on the human element.

Actuation is accomplished by a single foot pedal, leaving the hands free to handle the materials.

By referring to the cut at the right, these details of construction will be located:





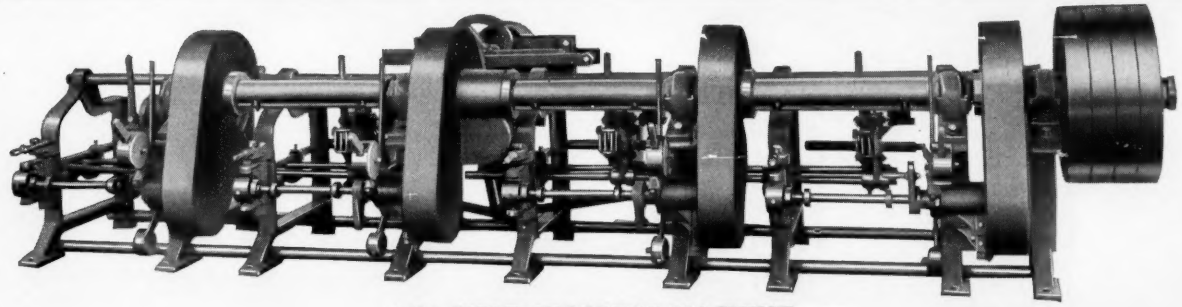
No. 1 is the Operating Switch. No. 2 is the Heat Switch. No. 3 is the Limit Switch and Limit Switch Adjustment. No. 4 is the Space Adjustment and A is the Foot Pedal Control.

Rods From 3-16" to 3-8" Are Welded

with a minimum of annealing at the weld. Send for full details to

MICRO PRODUCTS COMPANY

140 Industrial Street, Dept. 731.
PEORIA, ILL., U. S. A.
European Office, H. A. Schlatter & Co.
Kusnacht-Zurich, Switzerland.



1423 WIRE SPOOLING MACHINE

An up-to-date design of automatic wire spooler or gang winder built for either four or six reels. Built in three sizes for bobbins from 3" to 24" diameter. Each winding arbor equipped with automatic traverse, measuring counter, and automatic stop on completion of wind. Speed 250-600 feet per minute. A single operator only required.

THE TORRINGTON MFG. CO.

TORRINGTON, CONN.

ADDOR
WIRE DIE WORKS

A Complete Plant To Furnish You With

WIRE DRAWING DIAMOND DIES — Of the finest quality diamond obtainable, weights guaranteed as stamped on the blanks and marked on the invoices.

CRUSHING BORTZ AND SPLINTS — For Adjusting Diamond or tungsten carbide dies, or polishing.

WE wish to acknowledge the many courtesies extended to us at the Wire Convention. The interest shown in our enterprise has convinced us that our long experience with American Wire Mills is a most valuable asset.

You can count on our absolute cooperation on the smallest problem you may encounter.

We are modernly equipped to repair all makes of diamond dies, alloy dies, at the lowest rates possible consistent with accurate workmanship.

You draw the wire, let us worry about your die problems.

We will furnish dies suitable to your individual needs.

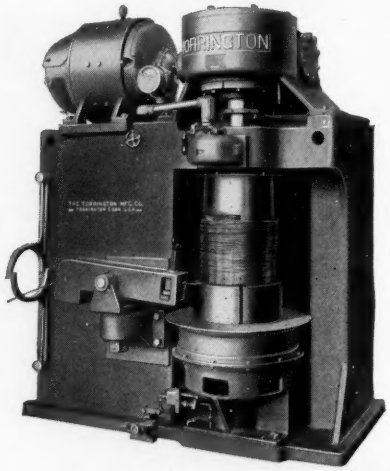
Let us go over your die problems with you.

Addor Wire Die Works

104 FIFTH AVENUE NEW YORK CITY

Torrington Announces New Bull Block

The machine illustrated, No. 1382 Bull Block is one recently designed by The Torrington Manufacturing Company of Torrington, Conn., and has many distinctive features—combining great sturdiness of construction with fast drawing speeds and the minimizing of handling time.



The outstanding feature of the design is the use of a drawing block suspended on its drive shaft. The drawn coil, instead of being lifted over the top of the block, immediately drops to a receive table, from which it is removed to truck or floor without lifting. The time interval necessary before starting a following coil is thereby reduced to a minimum and production greatly increased.

The block is driven by an adjustable speed motor located on top of machine pedestal driving vertical block shaft through a Cleveland Worm Gear unit in special casing. The block shaft is mounted in Timken roller bearings.

The block is equipped with full electrical control, all enclosed within the pedestal of the machine, which enables the operation of the block in the following manner.

A rheostat is first used to adjust the proper drawing speed. Throwing of control handle starts the block any speed approximately 15% of full speed, this preventing

the breaking of point. Full drawing speed is obtained automatically as the draw proceeds. That this drawing speed is the maximum possible for the draft being taken is observed by an ammeter placed to be easily visible and correction of speed can be made instantly by operation of rheostat.

Quick stopping by dynamic braking is made at the will of the operator, by lack of load at the completion of the draw, and similarly in the case of broken wire. Movement of a safety loop stops the block instantly in the case of tangled wire.

The blocks as designed are in three sizes as to draft capacity and use blocks up to 24″ diameter. For use with long lengths of small diameter wire a special two-piece block is employed to enable quick stripping of coil from block.

The motors employed are by Reliance Electric and Engineering Company, and electrical control has been designed and built for the design by the Electric Controller & Manufacturing Company.

✦ ✦ ✦

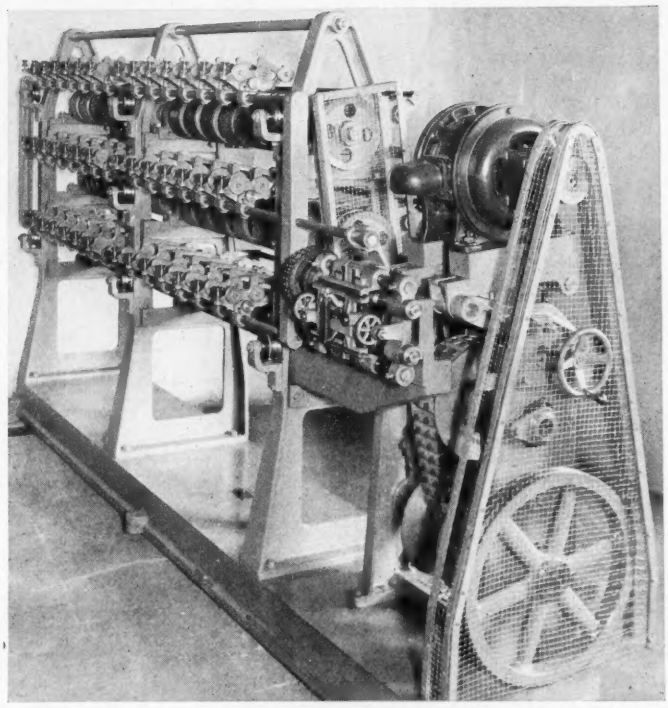
Rates on Brass and Copper Ingots

Trunk Line Association Proposal No. M-1741 proposes to establish a rate of $2.75 net on copper anodes, cathodes, slabs, bars, cakes, ingots and brass ingots, minimum weight 80,000 lbs., from Carteret, Perth Amboy, Brills and Newark, N. J., to Springdale, Bridgeport and New Haven, Conn., and $3. per net ton to Providence, Phillipsdale and Darlington, R. I., and New Bedford, Mass. Proposed rates to apply as proportional rates on traffic from beyond; Proposal No. 26642 proposes to establish a reduced rate of 31c per 100 lbs. on brass and copper ingots, carloads, from Tottenville, S. I., N. Y., to Toronto, Ont.

✦ ✦ ✦

Essex Wire Corporation, Highland Park, Mich., has purchased the Ilewill Manufacturing Co., Dayton, Ohio, manufacturer of extension cords, heater cord sets, plugs, etc., whose plant has been moved to Detroit and will be operated as a division of the Essex Company.

Rod, Wire, Cable, Strip and Tube Machinery



42 Wire Spooler
For Use With Multi-Strand Bright Annealing Furnace

WE BUILD

Chain Draw Benches—Multiple Coil Winders.
Flat Wire Rolling Mills—Rod Pointers.
Hollow Wire Straighteners and Equipment.
Multiple Strand Bright Annealing Units.
Stranders to Customers' Specifications.
Reelers and Spoolers for all sizes of Wire and Cable.
Reelers and Spoolers for Tinning, Galvanizing, Patenting and Annealing.

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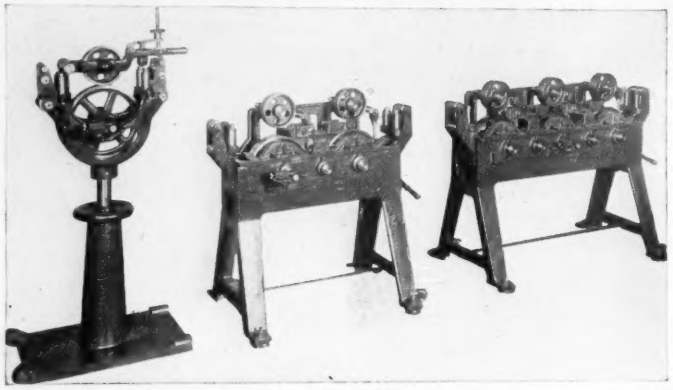
Designer and Builder of Special Machinery
107 Colden St., Newark, N. J.

MEASURING MACHINES FOR WIRE ROPE AND CABLES



We also manufacture

Cabling Machinery High Speed and Planitary
Standard Planitary Stranding and Closing Machines
Special Flat Strand and Lock Coil Machines
Improved High Speed TUBE Stranders
Patent Machine Stop and Signal
Special Machines Designed Enameling Machines
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Successors Royle & Akin
Fine Wire Manufacturers
OSSINING Established 1902 NEW YORK

Manufacturers of Fine Bare Wires

Copper Wire Specially Processed for Enameling Purposes

Copper
High Brass
Low Brass
Pure Tin
Cadmium
Bronze, Various Grades
Lead
Zinc
Commercial Bronze
Phosphor Bronze
Silver Plated Copper
False Gold

10%, 18%, 30% Nickel Silver

LAHN

False Gold Copper Silver Plated Copper

BRUSH WIRES CRIMP and STRAIGHT

Brass
Steel
Copper
Nickel Silver
Phosphor Bronze

Metallic Fibre for Packing Purposes

Wire Cloth Export Requirements

By Ernst Schroder

WIRE-CLOTH is one of the best export-articles of the wire industry, because this kind of material is used all over for many different purposes. Of course, a good knowledge of demand and requirements is necessary in case of exporting wire-cloth. Ore-, diamond- and gold mines need this material in larger quantities, and because of this South-Africa, Australia and Asia are large customers.

Gold-mines use the so-called filter cloth, which is required in thicknesses SWG 27 and 30. Diamond-mines of British-West-Africa need wire-cloth in SWG 29 to 31½. The cloth is made either of steel- or brass-wire. Diamond mines mostly prefer brass-wire cloth. Gross-wire-gauze is generally required in sizes of 14 mesh, with a thickness of SWG 21 or 16 mesh of SWG 27. If the cloth serves the purpose of manufacturing gross-sieves, it is used with 8 mesh wire SWG 24. Gold-mines also buy cloth of 4, 5 and 7 mesh of wire SWG 12, 13 and 15. Recently the Wolfram ore mines in South China started to buy large quantities of wire-cloth. Thin cloth is mostly used in the Manchuria and Siberia by gold-gossipings. The gauze is made of Phosphor-bronze or brass wire; is very thin and consists in the rule out of 60, 70 or 80 mesh of SWG 36½, 37½ or 38½. In Canada and Korea buyers are interested in the same kind of material, except that in these two countries a little coarser cloth is required; in 45, 50 mesh SWG 34 or 36 and the quality of the goods has to be very good. Manufacturers who want to sell wire-cloth abroad, must be careful to deliver good, well graded material, because even a slight deviation from the specification will lose the customer little discontent of customers causes a change in makers and suppliers.

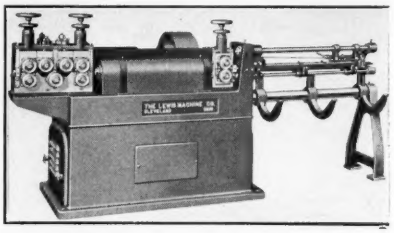
✦ ✦ ✦

New Wire Machinery

Description of Recently Developed New Tools of Interest to the Wire Industry

THE illustrations herewith show the new Lewis No. 8-C wire straightening and cutting machine which permits the use of faster feeds and cutting speeds, with a resultant increase in production heretofore impractical.

Increased production is brought about through improvements in time tested methods of straightening and cutting rather than by departure from proven standards.

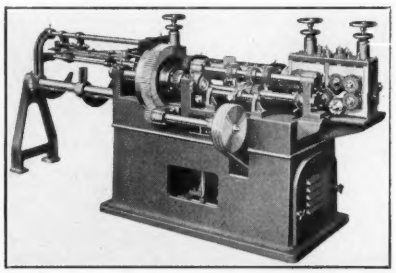


Particular attention has been given to rigid construction and the elimination of friction bearings. The following important mechanical features challenge comparison.

THE CUT-OFF is operated by an eccentric on the end of the flywheel shaft. This eccentric is so arranged that the wire is cut the instant the clutch is engaged so that the wire may be feeding through the machine during the remainder of the stroke or revolution of the flywheel. This reduces the cut-off to approximately 1/8 revolution of the flywheel, thereby reducing the feed roll slippage to a minimum, and practically eliminating all marking or swelling of the wire. This greatly increases the life of the feed rolls. The cut-off lever is made of steel.

THE THREE SPEED TRANSMISSION makes possible a range of feeds suitable for straightening all kinds of wire. Without this new and particularly attractive feature it is necessary to run the feed rolls slow enough to handle the "tough jobs", which speed is quite slow for ordinary commercial work. The three speed transmission overcomes this by furnishing a slow speed for straightening high carbon wire perfectly straight, as well as higher speeds for commercially straight wire without the use of variable speed motors which slow down the straightener arbor as well as the feed, thereby reducing the efficiency of the machine.

A SEVEN DIE STRAIGHTENER ARBOR with variable spacing between three of the straightener dies is furnished with the LEWIS No. 8-C Machine. This makes the machine capable of handling a greater range of sizes and allows the proper setting for any particular kind of wire within the capacity of the machine. It is easy to straighten wire at high speed on this machine.



THE FIVE ROLL STRAIGHTENER UNIT consists of five straightening rollers in combination with two sets of feed rollers making a total of seven, all mounted on Timken Roller Bearings. The two upper, or idler straightener rollers have INDEPENDENT ADJUSTMENT so that they can be properly adjusted to straighten the wire as it comes from the reel before entering the rotary straightener arbor. This unit allows a much faster feed with less offset in the arbor. It is a valuable asset on production work.

TIMKEN ROLLER BEARINGS are used on the rotary straightener arbor, all feed and straightener shafts, transmission shafts, idler sheave, flywheel and flywheel pinion shaft. This places all continuous running shafts on Timken Roller Bearings making a total of THIRTY-TWO ANTI-FRICTION BEARINGS on each machine. Such construction assures maximum service with minimum maintenance cost.

THE CLUTCH is similar to a standard punch press clutch having four-slot hardened alloy steel driving plate and key. Its positive action and simplicity of design are ideal for the service required.

ALL FEED and STRAIGHTENER DRIVE GEARS are ALLOY STEEL and HEAT-TREATED.

THE DOUBLE V BELT MOTOR DRIVE is quiet and efficient in operation. A double sheave is used on the motor, one set of three ropes driving the straightener arbor, another set of three driving the flywheel, feed, and roll straightener. And there are no gears or worm drives from the arbor to prevent its revolving at very high speed which allows a faster feed, with perfect straightening. The motor is mounted on adjustable rails in the base of the machine, where it is well protected from scale or excessive dust conditions. Adjustment is very simple and the adjusting screw is readily accessible. However, there is practically no stretch to the belts after the first stretch is taken up, so that frequent adjustment is not necessary.

✦ ✦ ✦

All papers presented at the recent meeting of the Wire Association will be published exclusively in Wire and Wire Products.

The first of the papers together with the discussion will appear in the August issue.

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A membership entitles you to the following:

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Meetings with men engaged in problems similar to your own and the exchange of ideas.

Participation in technical sessions and discussions and admission to the annual meetings.

The services of the Association information and research facilities.

A subscription to WIRE & WIRE PRODUCTS—the official publication of the organization.

A copy of the annual Buyers' Guide and Year Book of the Wire Association.

Fill out the membership application blank on page 267 and send it in immediately.

THE WIRE ASSOCIATION

551 5th Avenue **New York, N. Y.**

Exports and Imports

(*Continued from page 298*)

Wire heddle receipts dropped to only 1,275,000 pieces, all of which were of French origin. The trade in wood screws again was lower, amounting to only 6,038 gross, valued at $1,002 of which 5,760 gross (679) came from Sweden.

✦ ✦ ✦

'Round the World With the Wire Industry

(*Continued from page 296*)

truded metals by producing various new patterns of aluminum moldings for automobile body work, copper and lead glazing sections, and zinc rods for the manufacture of primary batteries. An unusual section is one of lead, star-shaped and provided with a steel core to give tensile strength, used as the collector in electrostatic dust separators. A recent innovation is the extrusion of glazing sections in a lead-antimony alloy. It is claimed that frames made up of this alloy maintain their shape better and are easier to handle owing to their comparative toughness.

The same firm has developed several improved types of switchgear and fuses, including a 15-amp. ironclad double-pole switch, and switch cutout, a 60-amp., 250 volt cutout, and a range of knife switches. All of these embody improvements, among which is the use of cadmium copper, a material which is tough, springy, and not liable to softening when overheated for spring contacts. In the cutouts is incorporated a new type of fuse in which the formation of the porcelain provides an expansion chamber for the gases produced on rupture of the circuit.

✦ ✦ ✦

Brazil Continues To Increase Duties

FOR the fourth time in two months, the Brazilian Government has established a new offcial ratio between the Brazilian paper and gold milreis of 6$881 paper

milreis to 1 gold milreis, according to a cable from Rio de Janeiro. The former official ratio was 6$658 paper milreis to 1 gold milreis.

The effect is to increase the actual rates of import duty by approximately 3% of the previous rates. A nominal rate of 1$000 per kilo now works out to an actual rate of 4$803 paper milreis per kilo. Similarly, a nominal ad valorem rate of 50% now works out to 240.15% ad valorem.

✦ ✦ ✦

British Finance Polish Telephone System

AN agreement between the Polish Government and the Telephone and General Trust of London for the financing of a long-distance telephone system has just been reached, according to a statement made by the Polish Minister for Posts and Telegraph. The company is to grant a credit of £550,000 ($2,750,000) to cover the costs of construction, of which £250,000 ($1,250,000) will be paid in cash and the rest in cable, instruments, and other equipment.

✦ ✦ ✦

British Standardize Wire Solder

THE British Engineering Standards Association has recently issued a revised edition of the British Standard Specification for brazing solder. The new issue has been prepared in order that an additional grade, intended primarily for solder applied in the form of slittings and wire, might be incorporated. This grade is designated AA, and the three grades now covered by the specification are accordingly AA, A, and B. Another point of difference between the new issue and the one superseded is that the dimensions of certain of the wire sieves for testing granular solder have been modified so that they might be in exact agreement with the dimensions in the recently published British Standard Specification for wire test sieves.

✦ ✦ ✦

Metal Spools for Wire Drawing

Metal Spools for Annealing

Metal Bound Spools for Shipping

Metal Bound Reels for Shipping

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1870 — 1931

The Quality Diamond Dies

Balloffet Diamond Wire Dies Co., Inc.

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INHIBITOR

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80% of the Rods and Wire Cleaned in the Wire Industry have Our Inhibitors in the Pickling Solution.

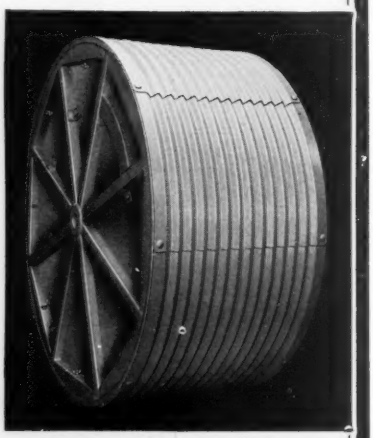
We know the critical requirements of Cleaning Rods to produce a good finished product.

We make a GOOD INHIBITOR

Ask Us.

The Wm. M. Parkin Co.
Chemical Engineers
PITTSBURGH, PA.

"Red Head"
Steel reels



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R. B. HAYWARD COMPANY
1714-1736 SheffieldAve.,Chicago
Under license arrangement with Electrical Research Products, Inc. Subsidiary of Western Electric Company, Incorporated.

American Alloy Co. Expands

THE American Alloy Company has purchased the property machinery and equipment of the Thos. Hamilton's Sons Company, 1340-52 East Berks Street, Philadelphia, one of the oldest steel and alloy wire manufacturing concerns in the country, having been in operation continuously since 1868. They have also purchased all the wire drawing equipment of the American Mond Nickel Company, located at Clearfield, Penna. This machinery will be moved to the company's new location.

The American Alloy Company specializes in the manufacture of resistance wire, pure nickel, Monel Metal, spark plug wire, stainless steel, nickel steel, nickel silver, etc. Their wire products are extensively used in the manufacture of electrical household heating devices, such as toasters, percolators, ranges; as well as for electrical measuring instruments, incandescent lamps, and electric furnaces. They will also manufacture pure nickel tubing and filament wire which are used in the radio industry.

In addition to the wire products, the Company will engage in the manufacture of Tungsten Carbide Tipped Tools, Wire Drawing Dies, Tube Mill Dies, and Welding Rods. These Tungsten Carbide materials are all outside the scope of the General Electric, Carboloy and Krupp's Widia patents.

M. L. Murray, founder of the Alloy Metal Wire Company, of Moore, Penna., who has had over thirty years practical experience in the manufacture and sale of alloy wires, is President of the Company. **Francis A. Harris** is the Vice President and Production Manager. He was formerly associated with the National-Harris Wire Company, of Newark, N. J., and has had over twenty years experience in the wire industry. **E. M. Kinsey**, an expert accountant associated with the Clarence H. Taubel's interests, is Secretary and Treasurer. **Dr. F. M. Bennett,** who for a period of fifteen years was Superintendent and in charge of the Laboratory for Queen &

Total Unit Cost
VERSUS
Silver Solder Cost

HANDY SILVER SOLDERS work so fast, and so **little** solder is required, that the **unit cost** for each splice is usually considerably lower than that of any other method.

Our Booklet No. 7WW contains useful information for wire workers or wire users. Send for it.

HANDY & HARMAN
57 William St., New York

British Wire Drawing and Wire Working Machinery

By H. Dunell, A. C. G. I., A. M. I. Mech. E., B. E.
(Editorial Staff, "The Engineer")

Written from the practical point of view, from the rolling of rods to forming of wire. 186 pages. Cloth bound boards, 7¾ x 11⅛ inches. Profusely illustrated from photographs. Indexed. Price $8.00 a copy, carriage prepaid.

Contents

I.	The Manufacture of Wire Rods
II.	Wire Drawing
III.	Dies
IV.	Wire Drawing Blocks.
V.	Continuous Wire Drawing Machines
VI.	Straightening and Cutting off Machines
VII.	Wire Factories
VIII.	Wire Netting Machinery
IX.	Wire Factories
X.	Wire Weaving Looms
XI.	Electric Cable Making
XII.	High Speed Stranding Machines
XIII.	Barbed Wire Machines
XIV.	Nail and Rivet Making Machines
XV.	Pin Making Machines
XVI.	Needle Making
XVII.	Safety Pin Making
XVIII.	Wire Chain Making
XIX.	Wire Flattening
XX.	Miscellaneous Machines

Remittance should accompany all orders.

Wire & Wire Products
551 Fifth Avenue, New York City

Co., manufacturers of electrical measuring instruments, is the Electrical and Mechanical Engineer.

✦ ✦ ✦

Electroplating Tungsten

Electroplating tungsten is reported practicable through a new process discovered by Prof. Colin G. Fink of the electrochemical department of Columbia University, and described by him in his laboratory.

A silvery circle of the new plate appears whiter than silver, and unlike silver, it will not tarnish when exposed to the air, Prof. Fink said. Tungsten is, in addition, one of the hardest of metals. Its melting point is 8,000 degrees Fahrenheit, more than twice that of chromium, and it is unlike all other metals used for plating in being insoluble in the strongest acids.

✦ ✦ ✦

Keystone Steel & Wire Safety Record

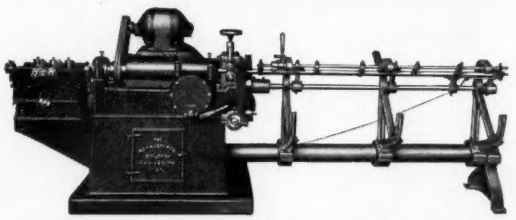
The Keystone Steel & Wire Company, Peoria, Illinois, shows a real improvement in its accident records. The Wire Mill had 27 lost time accidents during the first four months of 1930 and 10 in the corresponding period in 1931. During the same four month periods, the Steel Plant had 22 in 1930 and only 5 in 1931. These reductions are 63% and 77%, respectively. Mr. W. D. Speight, the Safety man, is to be congratulated on his fine improvement in his plant. And by the way, the hours worked were practically the same!

✦ ✦ ✦

Cable Engineers Elect Officers

At a recent meeting of the Insulated Power Cable Engineers' Association, Donald M. Simmons, chief consulting engineer, General Cable Corp., New York, was elected president. The other new officers are T. F. Peterson, cable engineer, American Steel & Wire Co., vice president, and Dr. R. J. Wiseman, chief engineer Okonite-Callender Co., secretary and treasurer.

COSTS HIT ROCK BOTTOM
when you use
SHUSTER MACHINES
for your
WIRE STRAIGHTENING AND CUTTING



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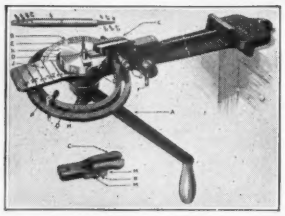

Patented April 2, 1918

LITTLE GIANT Wire Straightener

Adjustable Wire Reel Price $12.00

Patents Pending

Simple, easily adjusted and moderately priced, embodying necessary features to rapidly straighten wire at a minimum cost. Straightens and cuts No. 8 to No. 18 wire to any length. Strongly Constructed. Easily Operated. **Price $85.00.**

M. D. Kilmer & Company
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The Standard for High Carbon Wire

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For High or Low Carbon Wire

WIRE DRAWING SOAPS

Established 25 years.

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Electric Cable Standardization Saves $725,000 Annually

In less than two years the New York Edison Company has reduced the number of sizes and types of cable used by the system from 500 to 134. Of the 134 types remaining in use, 32 are listed as special for particular purposes, so that only 102 types and sizes are bought for general use.

As an immediate result of this simplification in materials it is estimated that the first cost of cable purchased annually by the system has been reduced by $725,000. This saving in original cost of cable is, however, only one of many advantages gained. Some of these advantages could hardly have been foreseen, for the studies undertaken with regard to the use of the various cables led to the solution of several technical problems in addition to the standardization of the physical dimensions and electrical characteristics of the cables themselves.

The same type of cable is now generally used for a given purpose in all of the companies in the system, and cable is purchased by all of the companies under the same standard specifications. Purchase under these specifications has insured high and uniform quality of cable throughout the system, storeroom stocks have been simplified, and smaller stocks suffice to meet all needs because cables can be readily transferred among the companies to meet any emergency. As secondary results a standard method of bonding cable sheaths in manholes has been adopted, thus assuring a greater degree of safety for workmen, and methods for testing and selecting portable cords for use on the system have been developed.

The magnitude of the work accomplished will be apparent when it is considered that the materials standardized range from small wire for lighting installations up to 45,000-volt feeder cables, covering various sizes and types used for transmission feeder and low-tension mains in the streets, the many cables used in stations, wires for the overhead distribu-

tion system, buried cable, and the portable cords used in field work and in the buildings of the various companies. The standard purchase specifications cover varnished cambric insulated cable, rubber insulated cable, weatherproof wire, tree wire, buried nonmagnetic sheath cable, vertical distribution cable, and bare wire.

Data sheets summarizing the sizes made standard were recommended and approved by executive order, each sheet being associated with specifications for the class of cable and giving detailed data for purchase, including standard stock lengths and factory tests.

In view of the success attained in this project, the method of organization is of interest. One of the first acts of the president, who assumed responsibility for the five system companies late in 1928, was the organization of two advisory committees—the Technical Advisory Committee and the Accounting Advisory Committee. These committees soon organized numerous subcommittees and working committees for the study of various problems. Two of the working committees were the Committee on Standard Specifications for Cable and the Committee on Sizes and Types of Cable. Both were subsidiaries of an Electrical Standing Committee.

Appointed in October, 1928, these committees began to function soon thereafter. In the short time of about a year and a half, their studies and recommendations resulted in executive orders producing the results already noted. During the work various associate committees were appointed on special problems so that those directly concerned with particular items were given an opportunity to assist in making the most advantageous decisions. According to the reports of the working committees the success attained is in no small measure attributable to the valuable assistance given by the various associate committees. In order to keep the standardization alive and up to date the members of the two working committees have been reappointed under the new designation of Working Committee on Cable Standards.

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DIAMOND AND TUNGSTEN CARBIDE DIES FOR WIRE DRAWING

We manufacture our complete diamond dies in this country from the very finest diamonds that are obtainable. We have made a study of wire drawing problems and manufacture the dies to fit your problems.

WE WOULD APPRECIATE AN OPPORTUNITY TO SERVE YOU

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TANTALUM CARBIDE DIES

in Stock in New York for prompt delivery

CORED, ROUGH DRILLED and FINISHED NIBS

any size from .010 to .300 for wire and tubing

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Ferrous and Non-Ferrous Wire Products

BETTER HEATING W.S. ROCKWELL CO. INDUSTRIAL ESTABLISHED 1888 FURNACES NEW YORK LOWER COST

Complete heating equipment for strand annealing, billet heating and intermediate operations.
Bright annealing furnaces for ferrous and non-ferrous metals.

"Furnace and Fuel to Suit Conditions"

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Industrial Heating Equipment

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OVER **100 Welding Rods Per Minute**

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THE NEW LEWIS WIRE STRAIGHTENING AND CUTTING MACHINE

AT THE WIRE SHOW, CLEVELAND, O., JUNE 15-19

WE CAN MEET THE MOST EXACTING REQUIREMENTS
WRITE FOR INFORMATION

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The crack trains, which pay best, are trusted solely to men, who have learned from—*Experience*

—As wire drawers for over 30 years, we know from *Experience* the particular shape of die for each material. We have found from this same experience that our special casting method of setting is best.

Why not let us quote on your diamond die requirements?

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Smooth Draw — Highest Quality

WIRE DRAWING
Machinery and Equipment

Rod Frames—16" Frames
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Wire Pointers—Puller Tongs
General Castings for Wire Mill Use
Circulars on Request.

E. J. SCUDDER FOUNDRY & MACHINE CO.
TRENTON N.J.

"Facts about Tungsten Carbide Drawing Dies" is the title of a new booklet just issued by the Master Wire Die Corp., of New York City.

The booklet treats briefly but effectively with the requirements for dies for wire drawing and includes useful tables of decimal equivalents, standard wire gauges, and split gauges in decimal sizes.

✦ ✦ ✦

The Newhall Chain Forge & Iron Company of New York City, has just issued a new pamphlet that simplifies references and selections of various types of sling chains by means of numbered illustrations of many types of completed slings, as well as numbered illustrations of sling parts, such as end rings, links, hooks, connecting links, etc. This pamphlet is No. F-9110 and will be mailed to those requesting it.

✦ ✦ ✦

The W. S. Rockwell Company of New York City, have recently issued a number of very interesting data sheets relating to industrial heating.

These sheets are extremely informative and are copyrighted. They are however, available for distribution upon request.

Some of the subjects covered are 'Continuous Heat Treating," Bulletin No 312, "Economics of Industrial Heating" Bulletin No. 294, "Heat-Treating and Carburizing Furnaces" Bulletin No. 295, 'Rotary Carburizing Furnaces" Bulletin No. 296, "Rotary Heat-Treating Furnaces" Bulletin No. 297, "Continuous Strand Heat Treating Furnace" Bulletin No. 302, "Non-Oxidizing Furnace" Bulletin No. 306, "Continuous Heat-Treating Furnaces" Bulletin No. 309.

Any of these bulletins may be obtained upon request from the W. S. Rockwell Company, 50 Church Street, New York City.

✦ ✦ ✦

All papers presented at the Wire Association Meeting at Cleveland, June 15 to 19, will be published in the August and September issues of Wire and Wire Products.

Automatic Combustion Control Systems

(*Continued from page 294*)

switched in to intensify the regulating force.

GREAT simplicity characterises the electric regulator manufactured by Messrs. Kieback & Peter; this regulator is shown in Fig. 10. The changes in the length of the thermostat are multiplied many times by a suitable link motion, thus enabling the temperature changes to be utilised for opening or closing the contacts of the switching device, and thus operating a remote control switch which either controls the heat supply directly or by way of a special contactor. ✦ ✦ ✦

Part 1, Sec. 2. of this article will be published in the August issue of Wire and Wire Products.

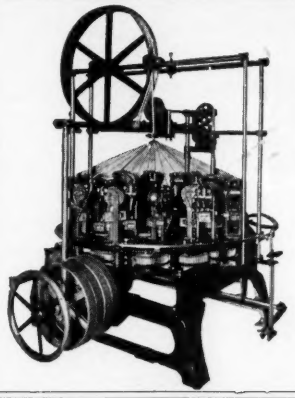
✦ ✦ ✦

1930 Year Book of American Bureau of Metal Statistics

The year book of the American Bureau of Metal Statistics, bringing the statistical record of the non-ferrous metal industries up to the end of 1930, which is compiled annually by W. R. Ingalls, director of the Bureau, is now available for distribution.

As in previous years, it presents an authentic record of the production statistics of the world on leading non-ferrous metals including copper, lead, zinc, silver and tin. Statistics are also presented on nickel, cadmium, antimony and aluminum. The bulk of the figures, however, deal with the production, consumption and foreign trade in copper, zinc and lead which are supplemented by much valuable information as to producers, markets, refining and smelting capacities and other detail. The book sells for $2.00 a copy. ✦ ✦ ✦

The Smith Fence Company, manufacturer of chain link fencing, with plant and headquarters at 741-743 Northland Avenue, has completed the installation of a new galvanizing department, providing for day and night operation of the company's plant.



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Multiple Head Wire Covering Braiders

Single, Double or Triple Deck Wire Covering Braiders

Single, Double or Triple Deck Cable Braiders

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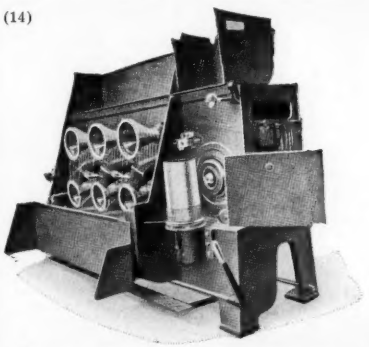

Model S-1 BREGUET HIGH-SPEED WIRE DRAWING MACHINE

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EXCLUSIVE AGENT FOR
the United States, Canada, Mexico, Central and South America of the

"BREGUET" HIGH-SPEED WIRE DRAWING MACHINES

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SEND FOR CATALOG

Can be supplied for a maximum of 25 dies and draws the finer sizes of copper wire at a finishing speed of 4000 to 4500 feet per minute.

Patents—Trade Marks

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A CORRECTION

In the March 1931 issue of WIRE & WIRE PRODUCTS a description of Konel metal was published in which it was stated that this metal was produced by the General Electric Research Laboratories. This was in error as this metal was developed by and is a product of the Westinghouse Electric & Mfg. Company.

WANTED—One set-up man on Waterbury-Farrell screw machines (automatic). Will probably have to grind his own tools. Location: New York City; Salary about $40.00. Box 300, WIRE AND WIRE PRODUCTS, 551 Fifth Avenue, New York, N. Y.

WANTED—Man who has specialized in Diamond Steel setting, Die casting or pressing. Must be thoroughly experienced. Apply to Box 200, Wire & Wire Products, 551 Fifth Ave., New York, N. Y.

The Waterbury Wire Die Co.

Diamond, Composition and CHILLED IRON DIES
Waterbury, Conn.

"The House of Service"
Bellet Diamond Die Works
Manufacturers of
DIAMOND DIES and COMPOSITION DIES
Factories { Trevoux—France / New York, N. Y.
New York Office 315 Fifth Ave.

Micarta Rolls For Wire and Rod Mills

MICARTA, a phenolic resinous material of extreme strength manufactured by Westinghouse, has given exceptional service as a bearing liner in wire, rod, bar and merchant mills. Representative installations, where the pressures are not excessive and the peripheral speeds vary from 100 to 1000 feet per minute, have shown this material to be superior to any other plain type bearing for roll neck service.

Water alone is used as a lubricant without any change in the conventional cooling system. Impure water, containing weak acids and alkalies, has no effect on Micarta and may be used without damage to the bearing. Seizing and grabbing, so common to other types of non-metallic bearings, is eliminated due to the non-absorbing and non-warping qualities of Micarta. In addition, the peculiar characteristics of the bearing material reduces scoring to a minimum. Particles of sand, grit and scale coming in contact with the surface of the bearing will imbed themselves and cause only the slightest scratching. This is due to the relatively low Brinnell hardness of the material which permits charging and eliminates scoring. Micarta bearings have a slight resilience that enables them to withstand shocks and blows that damage and fatigue ordinary alloy liners.

The three essential parts of the bearings are composed of radial segments, thrust block, and housing. The radial segments usually are 120° pieces so constructed that the wear at any point is at right angles to the grain of the material. The thrust block consists of a separate piece of Micarta so mounted that maximum life is afforded since the edge of the roll rubs against the grain. The thrust block and radial segments are assembled in a machined housing and are held tightly in place. The thrust collar is prevented from turning by a recess machined in the metal housing. Either the thrust collar or radial segments may be replaced independently without any special machine setup.

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IN NICKEL STEEL SETTINGS
also Composition Dies

Manufacturers for Over 35 Years
[Originators of the Steel Setting]
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Specializing in Galvanizing Plants Designed and Installed
Practical Engineering Advice
Vanderbilt 7895

Distribution channels are machined in the bearing surface in order that proper cooling and lubrication are afforded. A typical bearing assembly with component parts is illustrated in the photographs.

Savings in power due to the low coefficient of friction and polishing effect of the material amount to as much as 30%. Additional savings are realized by the elimination of grease and oil, reduced roll maintenance and ease of replacement of either segment or thrust parts combined with long life make Micarta a desirable material for this application.

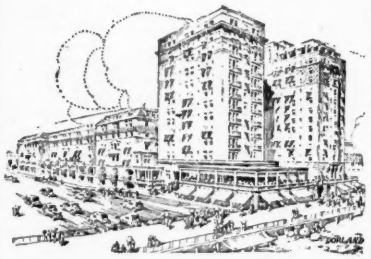
✦ ✦ ✦

Cable Accessories Corporation, Pittsburgh, Pa., has been acquired by the **Anaconda Wire & Cable Co.** With manufacturing facilities located at Hastings-on-Hudson, N. Y., the latter is now making a full line of indoor and outdoor terminals, potheads, junction boxes, split joint boxes, jointing materials, insulating compounds and Duct recording thermometers.

The
St. Charles

On the Boardwalk
At New Jersey Avenue

ATLANTIC CITY



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For more complete information, consult the annual Directory, Index & Buyers' Guide.

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See Furnaces—Various Headings

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Scudder, E. J., Fdry & Machine Co., Trenton, N. J.

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Amer. Insulating Mach'y Co., Phila., Pa.
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Torrington Mfg. Co., Torrington, Conn.
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Vaughn Machinery Co., Cuyahoga Falls, O.

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COPHOLDERS
Mossberg Pressed Steel Corp., Attleboro, Mass.

CRANES—Wire Mill
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

DIES—Chilled Iron
Waterbury Wire Die Co., Waterbury, Ct.

DIES—Composition
Addor Wire Die Works, N. Y.
Bellet Diamond Die Works, N. Y.
F. Krause, Inc., Jersey City, N. J.
Ramet Die Corp., Chicago, Ills.
Urdika Wire Die Works, Inc., New York

DIES—Diamond
Addor Wire Die Works, N. Y.
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Bellet Diamond Die Works, N. Y.
Cochaud Wire Die Co., New York.
Detroit Wire Die Co., Detroit, Mich.
Driver-Harris Co., Harrison, N. J.
Koebel Wagner Diamond Corp., Newark, N. J.
F. Krause & Co., Inc., Jersey City, N. J.
Master Wire Die Corp., New York, N. Y.
Union Wire Die Corp., New York, N. Y.
Urdika Wire Die Co., N. Y. C.
Vianney Wire Die Works, New York.
Waterbury Wire Die Co., Waterbury, Ct.

DIES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

DIES—Repairs & Re-Cutting
Addor Wire Die Works, N. Y.
Balloffet Diamond Wire Dies Co., Inc., N. Y. C.
Bellet Diamond Die Works, N. Y.
Cochaud Wire Die Corp., New York.
F. Krause & Co., Inc., Jersey City, N. J.
Urdika Wire Die Co., N. Y. C.
Vianney Wire Die Wks., N. Y.

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F. Krause, Inc., Jersey City, N. J.

DIES—Rod and Tube Drawing
Carboloy Co., Inc., Newark, N. J.
Master Wire Die Corp., N. Y.
Union Wire Die Corp., N. Y.

DIES—Tantalum Carbide
Ramet Die Corp., Chicago, Ills.

DIES—Tungsten Carbide
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Carboloy Co., Inc., Newark, N. J.
Master Wire Die Corp., New York, N. Y.
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Vaughn Machinery Co., Cuyahoga Falls, O.
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W. S. Rockwell Co., New York, N. Y.

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FURNACES—Bright Annealing
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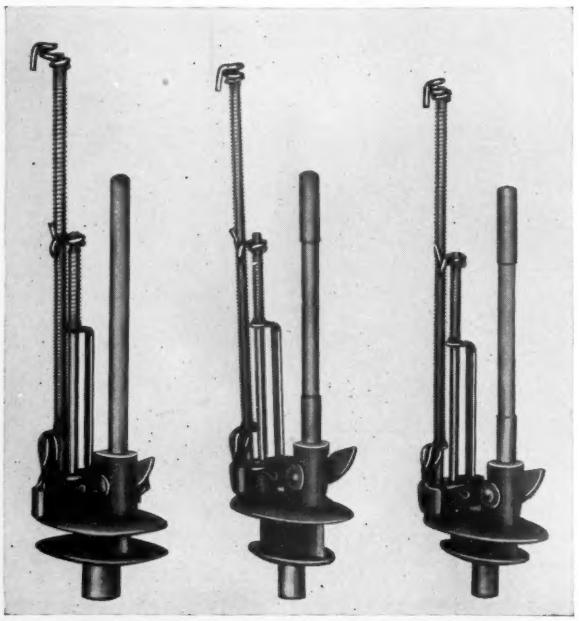
Economy Plus Speed



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Sleeper & Hartley, Inc., Worcester, Mass.
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Watson Machine Co., Paterson, N. J.

MACHINERY—Barb Wire Bale Tie
John A. Holmquist, Aliquippa, Pa.

MACHINERY—Block Stripper Wire Spool
John A. Holmquist, Aliquippa, Pa.

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Mossberg Pressed Steel Corp., Attleboro, Mass.
New England Butt. Co., Providence, R. I.

MACHINERY—Bunching
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Haskell-Dawes Machine Co., Phila., Pa.
New England Butt Co., Providence, R. I.
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Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

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New England Butt Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Company, Paterson, N. J.

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Kilmer, M. D., Co., Cleveland, O.
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MACHINERY—Galvanizing Wire
Morgan Construction Co., Worcester, Mass.
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MACHINERY—Gang Winders
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MACHINERY—Insulating
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MACHINERY—Lead Stripping
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American Insulating Mach'y Co., Phila., Pa.
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Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Measuring Wire
New England Butt. Co., Providence, R. I.

MACHINERY—Nail
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Vaughn Machinery Co., Cuyahoga Falls, O.

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Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
The Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Rivet
Waterbury-Farrell Fdry & Machine Co.,

MACHINERY—Rod
Fred'k M. Conran, Newark, N. J.
Morgan Const. Co., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrell Fdry & Machine Co., Waterbury, Conn.

MACHINERY—Rubber Strip Covering
American Ins. Mach'y Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Screw Wire
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Spooling
Fred'k M. Conran, Newark, N. J.
American Insulating Machinery Co., Phila.
Torrington Mfg. Co., Torrington, Conn.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Spring Making
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Lewis Machine Co., Cleveland, O.
F. B. Shuster, New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Straightening Hollow Wire
Fred'k M. Conran, Newark, N. J.

MACHINERY—Stranding
American Insulating Mach'y Co., Phila Pa.
Fred'k M. Conran, Newark, N. J.
Haskell-Dawes Machine Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Wm. E. Somerville & Co., Coal City, Ill.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

The Hygrade Lamp Company of Salem, Mass., has effected a merger with the Sylvania Products Company and the Nilco Lamp Works, Inc., both of Emporium, Pennsylvania. Hygrade is the legal vehicle of the consolidation which will be effected without change in locations.

✦ ✦ ✦

An agreement has been reached between the American Cable Co. and certain foreign cable makers under which the American company grants licenses to manufacture "preformed" wire rope. Among the participants are the Australian Wire Rope Co., British Ropes, Ltd., Felten & Guilleaume A. G. and a Canadian maker.

H. G. Chase has been appointed sales manager of the Standard Alloy Co., Cleveland. He was formerly with the General Alloys Corp.

✦ ✦ ✦

R. D. Bean, formerly Manager of the Engineering Development Department of The Brown Instrument Company, Philadelphia, has been made Chief Engineer of that company.

✦ ✦ ✦

F. F. Elliott has been appointed mill and foundry general superintendent of the Westinghouse Electric and Manufacturing Company.

In his new position Mr. Elliott will have general charge of the brass foundry, copper mill and Trafford Foundry operations. The works manager also announces that **H. F. Seifert** has been appointed superintendent of the brass foundry and copper mill; **C. R. Stevens** named purchasing engineer of the purchasing department, and that **J. R. Thompson** will continue as superintendent of the Trafford Foundry and Pattern Shop.

✦ ✦ ✦

All papers presented at the Wire Association Meeting will be published in Wire and Wire Products.

BUYERS' GUIDE, Continued

MACHINERY—Strip Steel
Broden Const. Co., Cleveland, O.
Fred'k M. Conran, Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.

MACHINERY—Swaging
Sleeper & Hartley, Worcester, Mass.
Waterbury-Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Taping
Amer. Insulating Mach. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Company, Paterson, N. J.

MACHINERY—Trolley Wire
Torrington Mfg. Co., Torrington, Conn.
Waterbury Farrel Foundry & Machine Co., Waterbury, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube
Fred'k M. Conran, Newark, N. J.
Torrington Mfg. Co., Torrington, Conn.
Waterbury-Farrell Fdry. & Machine Co., Waterbury, Conn.

MACHINERY—Welding Wire
Micro Products Co., Peoria, Ill.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Winding
American Insulating Mach'y Co., Phila., Pa.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Insulating Machinery Co., Phila.
Broden Const. Co., Cleveland, Ohio.
Fred'k M. Conran, Newark, N. J.
Morgan Construction Co., Worcester, Mass.
E. J. Scudder Foundry & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Manufacturing Co., Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.

MACHINERY—Wire Rope
New England Butt Co., Providence, R. I.
Wm. E. Somerville Co., Coal City, Ill.
Watson Machine Company, Paterson, N. J.

PACKING—Metallic Fibre
Hudson Wire Co., Ossining, N. Y.

POINTERS—Wire
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

POTS
Columbiana Boiler Co., Columbiana, O.

POTS—Lead Melting
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Encasing
John Robertson Co., Brooklyn, N. Y.

PRESSES—Lead Extrusion
John Robertson Co., Brooklyn, N. Y.

PULLERS—Wire
E. J. Scudder Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
John Robertson Co., Brooklyn, N. Y.

REELS AND SPOOLS—All Kinds
R. B. Hayward Co., Chicago, Ill.
Hubbard Spool Co., Chicago, Ill.
Mossberg Pressed Steel Corp., Attleboro, Mass.

REEL AND TENSION STAND—
Sleeper & Hartley Inc., Worcester, Mass.

REEL CRUTCHES
R. B. Hayward Co., Chicago, Ill.
Watson Machine Co., Paterson, N. J.

SOAPS—Wire Drawing
R. H. Miller Co., Homer, N. Y.
J. T. Robertson Co., Syracuse, N. Y.

SOLDER
Kester Solder Co., Chicago, Ill.

SOLDER—Silver
Handy & Harman, N. Y.

SPOOLS—Annealing—Detachable Head Handling—Wire Stitching
Mossberg Pressed Steel Corp., Attleboro, Mass.

SPOOLS—Fibre
Sefton Nat'l Fibre Can Co., St. Louis, Mo.

TRUCKS
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

VULCANIZERS
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS
American Insulating Mach'y Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WIRE—Various Kinds
Hudson Wire Co., Ossining, N. Y.
Wickwire Spencer Steel Co., N. Y. C.

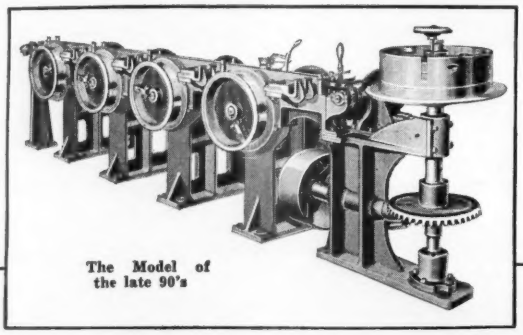
This is a carefully classified index of concerns who specialize in this industry and who advertise regularly in WIRE & WIRE PRODUCTS. Please mention WIRE when writing to these firms.

WATERBURY-FARREL TANDEMS

Three Decades Perfecting Continuous Wire Drawing Machines

We thought the old machines were pretty good in the old days (and they were) but times have changed. Today we offer not a better method nor a new principle, but—a far better machine that meets in eloquent fashion every demand of the present day—

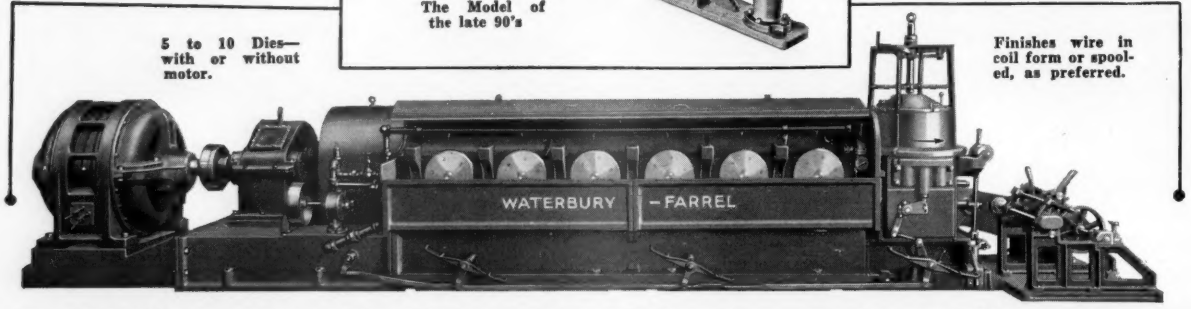
High Speed
Low Operating Cost
Mechanical Efficiency



The Model of the late 90's

5 to 10 Dies—with or without motor.

Finishes wire in coil form or spooled, as preferred.



No. 1 Machine. Forced feed lubrication. Ball Bearings throughout. Starting size, 5/16" copper rod.

The Waterbury Farrel Foundry and Machine Company

Home Office and Works: Cottage Place, Waterbury, Connecticut **Western Sales Office: Cleveland, Ohio**

THE WATSON MACHINE COMPANY

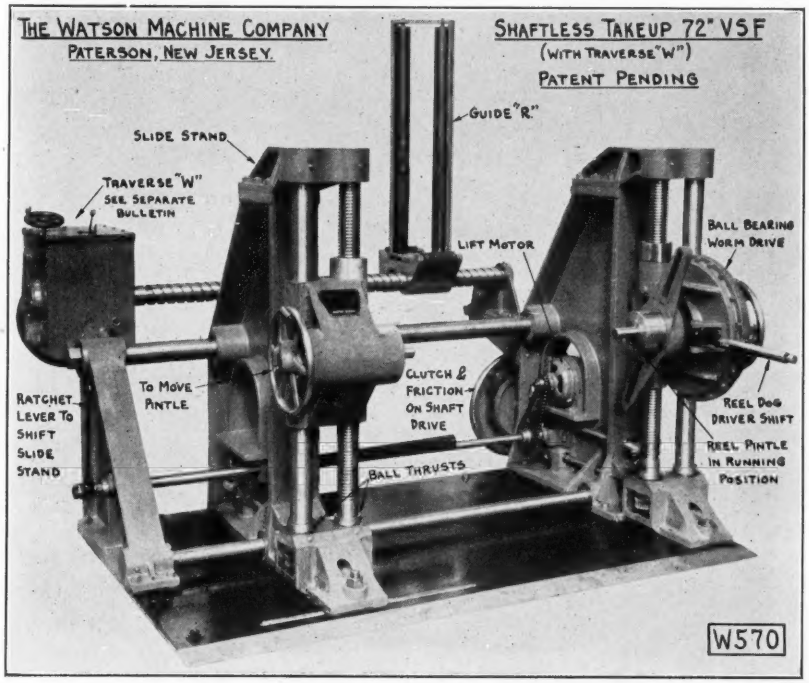
ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.

ENGINEERS - FOUNDERS - MACHINISTS

SHAFTLESS TAKEUPS TYPE "V"

For Heavy Duty
(Patent Pending)



THE MOST IMPORTANT SINGLE POINT OF THIS TYPE IS THE ELIMINATION OF THE REEL SHAFT.

The elimination of minor injuries to operator in handling large reel shafts is also a point of considerable value.
Two sizes are built—

72″ for loads up to 6 tons (picking up 36″ or larger reels from base).

96″ for loads up to 10 tons (picking up 48″ or larger reels from base).

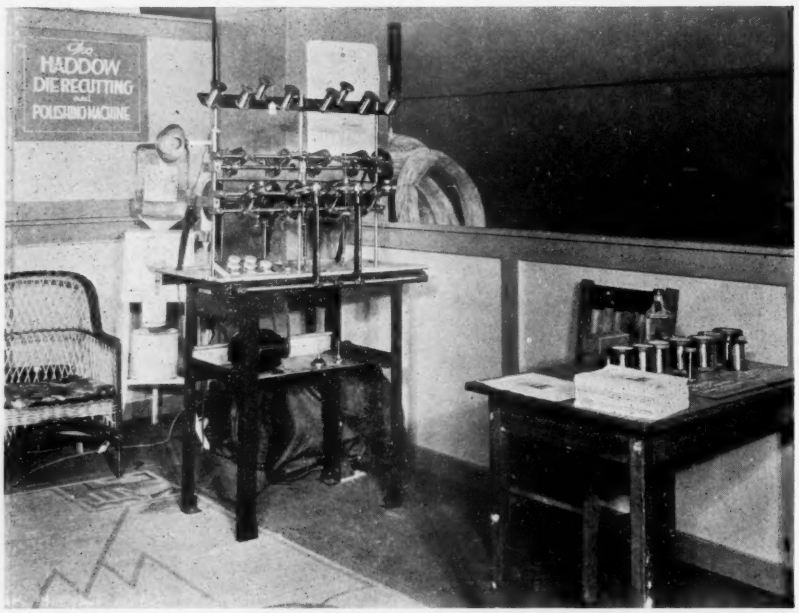
The multiple disc slip-friction is adjustable in operation and this, with the slack takeup handwheel combined with positive clutch, centers drive control at the stand in a convenient position.

ELECTRICAL WIRE AND CABLE
WIRE ROPE and CORDAGE MACHINERY

Did You See
THE HADDOW
DIE RE-CUTTING AND POLISHING MACHINE
In Operation at the Wire Show?

Every Claim Made Was Proven by Actual Demonstration Using Worn Dies Brought by Interested Wire Men

With this Machine You Can Reduce Your Die Recutting Cost to a Fraction of Present Costs



Any Unskilled Operator Can Learn to Handle It Quickly and Efficiently

4 HEAD MACHINE—Also Made in 6-Head size (With 2 Heads for Heavier Dies).

With only one man—This machine will do the work now requiring four to six men in less time and at lower cost.

Recuts dies about ten times faster than by the needle and dust methods and with less diamond dust.

One Month's Shop Production

Total number of dies cut 1047

Total number of hours required—182.5

Average number of dies per hour—5.73

Number of operators—1

THIS MACHINE WILL SAVE THOUSANDS OF DOLLARS FOR YOU

Fully Protected by Patents

For Information About Shop Rights

WILLIAM HADDOW

17 Eastern Ave. **Ossining, N. Y.**